

*Institute of*  
*Veterinary Preventive Medicine*  
**RANIPET**

*Silver Jubilee Souvenir*

27th October 1957

# Contents

	PAGE
1. <i>Succession List of Superintendents</i> ... ..	iii
2. <i>Staff of the Institute</i> ... ..	iv
3. <i>History of the Institute of Veterinary Preventive Medicine</i> ... ..	1
4. <i>Rinderpest and its control in Madras</i> ... ..	10
5. <i>Freeze Dried Rinderpest Goat Tissue Vaccine</i> ... ..	15
6. <i>Haemorrhagic Septicaemia and its control</i> ... ..	18
7. <i>Blackquarter and its control in Madras State</i> ... ..	22
8. <i>Anthrax and its control</i> ... ..	25
9. <i>Brucellosis and its control</i> ... ..	28
10. <i>Sheep Pox and its control</i> ... ..	30
11. <i>Ranikhet Disease and its control</i> ... ..	32
12. <i>Fowl Pox and its control</i> ... ..	35
13. <i>Veterinary Investigation and Research—</i>	
(i) <i>Investigation into the diseases of cattle</i> ... ..	38
(ii) <i>Investigation into the diseases of poultry</i> ... ..	39
(iii) <i>Investigation into diseases of sheep and goats</i> ... ..	40

17 NOV 1957  
MADRAS



SRI P. V. RAJAMANNAR  
*Acting Governor of Madras.*

RAJ BHAVAN,  
Guindy, Madras-22,  
October 11, 1957.

MESSAGE

I am glad to learn that the Institute of Veterinary Preventive Medicine, Ranipet, is completing 25 years of its existence and the Silver Jubilee of the Institute will be celebrated from 27th October 1957 when the Chief Minister will inaugurate the function and the Minister for Home and Agriculture, Government of Madras, will preside.

Part of the agricultural wealth of India has been its livestock even from Vedic times. It was great Emperor Asoka who first recognised the need for establishing veterinary hospitals.

Rinderpest was one of the dire diseases which was taking a heavy toll of cattle and causing great economic distress to the ryots. The Anti Rinderpest Serum has been found to be useful in controlling this disease. It is gratifying to learn that the Institute has been manufacturing on a large scale Anti Rinderpest Serum and other biological products for the treatment of different diseases to which cattle are prone. Very rightly alongside manufacture, I find research work being carried on in an endeavour to discover new and efficient products to control other contagious and infectious diseases of livestock. Not the least commendable feature of this Institute is its saving to the Government. I am certain that the Institute will play a large part in the development of livestock in the State which is envisaged in the Second Five Year Plan. I wish the celebration of the Silver Jubilee of the Institute all success.

(Sd.) P. V. RAJAMANNAR,

Governor of Madras.





SRI K. KAMARAJ  
*Chief Minister of Madras.*

K. KAMARAJ,  
CHIEF MINISTER OF MADRAS.



Fort St. George  
MADRAS.

27th October. 1957.

MESSAGE.

It is a matter of satisfaction that the Institute of Veterinary Preventive Medicine, Ranipet, is now celebrating its Silver Jubilee on the completion of 25 years of its useful existence. It has done good work especially in regard to the production of different vaccines and biological products, for controlling important diseases of Livestock and Poultry. It is indeed a matter for warm congratulation that our Institute has been able to supply the Vaccine requirements of the neighbouring States as well and that it has gained recognition all over the Country. I have no doubt that it will continue to maintain its high standards, with a very bright future.

K. KAMARAJ,

Chief Minister of Madras



SRI M. BHAKTAVATSALAM  
*Home, Food and Agriculture Minister*

**M. Bakthavatsalam,**  
MINISTER FOR HOME.



**Fort St. George**  
**MADRAS.**

16th October, 1957.

### MESSAGE

The Institute of Veterinary Preventive Medicine, Ranipet, celebrates its Silver Jubilee during this month. From a humble beginning in 1932 as a Centre for the production of Serum and Virus Vaccine for the Control of Rinderpest in this State, it has steadily grown into a Research Institute dealing in numerous biological products. It is a matter of pride that the Institute has evolved as a result of the Research work done there, new vaccines and biological products which have been found useful not only in this State but also in other parts of the Country. That this Institute has played its role in rooting out that fell disease—rinderpest of cattle—is a matter for high appreciation. The Institute has already gained recognition all over the country and I am confident that the Institute will still more enhance its usefulness. I wish the Institute a bright future.

**M. BHAKTAVATSALAM,**  
Minister for Home.

MESSAGE FROM UNION MINISTER FOR FOOD AND AGRICULTURE.

MINISTER FOR FOOD & AGRICULTURE,  
GOVERNMENT OF INDIA,  
New Delhi,

October 9, 1957.

Dear Sir,

On the occasion of celebrating the Silver Jubilee of your Institute I send my greetings. Your Institute has done good work in the past and I do hope that it will maintain its tradition.

I wish you a success.

Yours faithfully,

Sd/-

(Ajit Prasad Jain)

**M. S. RANDHAWA**, D.Sc., F.N.I., I.C.S.,  
Vice-President, I.C.A.R. & Additional Secretary  
to the Government of India, Ministry of Food  
& Agriculture.

17 NOV 1957  
Telephone: 48696  
Telegram: AGRISEC

INDIAN COUNCIL OF AGRICULTURAL RESEARCH  
QUEEN VICTORIA ROAD, NEW DELHI.

No. 4728. VP-57.

Dated October, 1957

Dear Shri Pattabiraman,

I am glad to learn that the Silver Jubilee Celebrations of the Institute of Veterinary Preventive Medicine, Madras, are being held this year. I wish I were able to be present on the occasion but my other pre-occupations deny me that privilege.

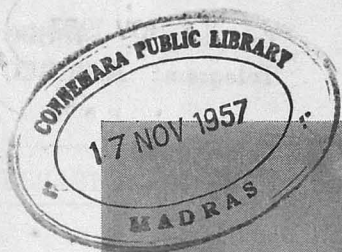
Madras has the distinction of always being in the vanguard of progress in education and research. This Institute is no exception. The department of Animal Husbandry deserves congratulations on the striking results achieved. The Institute had a humble beginning and was originally designed and started for the limited purpose of producing anti-rinderpest serum and Rinderpest vaccine to meet local requirements. But as a result of the initiative patience and perseverance of the workers as well as of the active support of the Madras Government, this Institution has made rapid progress and today its activities cover almost the entire field of diseases which afflict cattle, poultry, sheep and goats. The Institute has also a number of research schemes in hand with a view to evolving new and better types of vaccines.

India is a large country and there is need as well as scope for further stations of this kind. Madras has shown the way.

Yours sincerely,

(Sd.) M. S. Randhawa





DR. D. PATTABHIRAMAN  
*Director of Animal Husbandry, Madras.*

Dr. D. Pattabiraman, G.M.V.C., A.I.D.I.,  
Director of Animal Husbandry,  
MADRAS

Animal Husbandry  
Department,

Dated 21st Oct. 1957.

### MESSAGE

It gives me immense pleasure to send this message of good will to the Institute of Veterinary Preventive Medicine at Ranipet on the occasion of its 'Silver Jubilee Celebrations' on 27th October 1957.

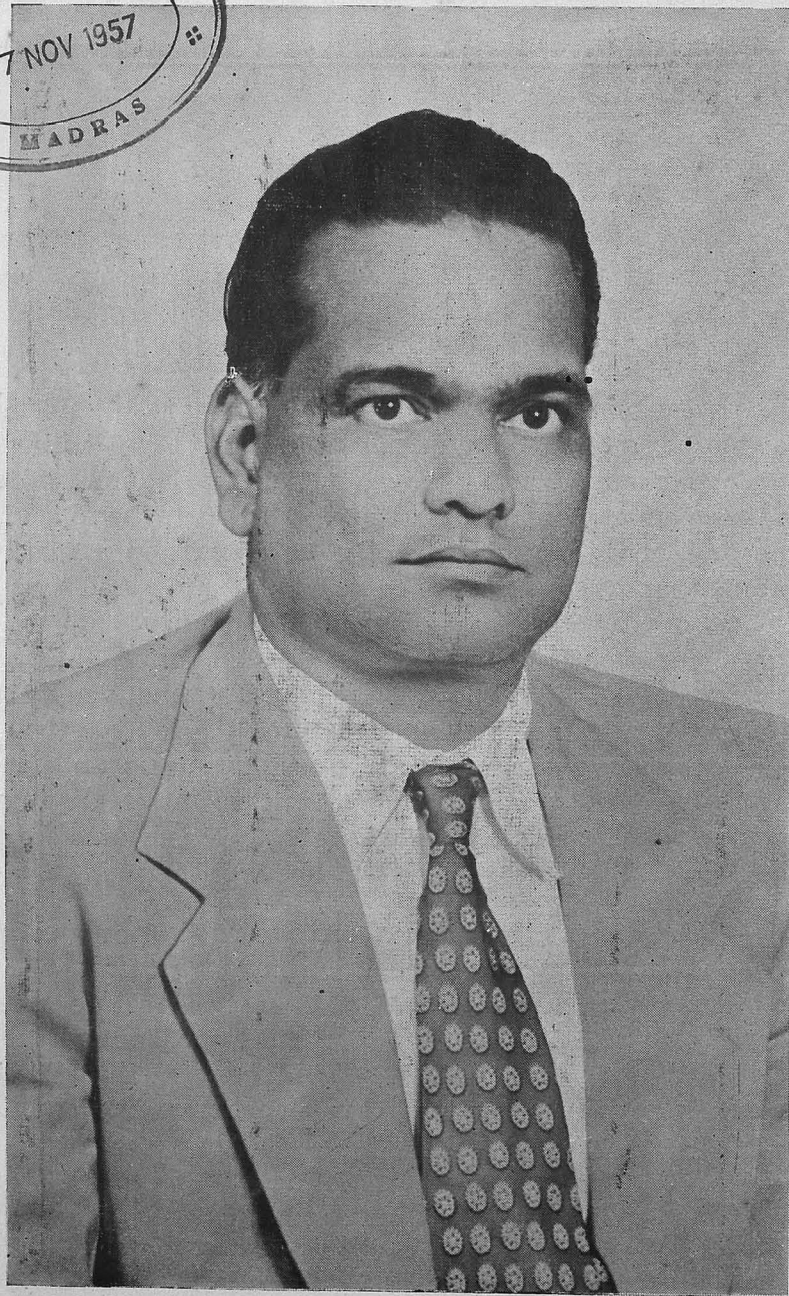
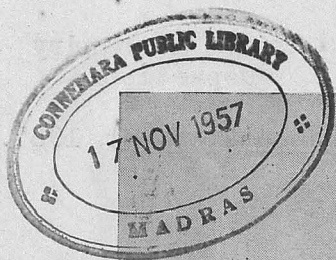
As one who had worked on its staff in the early days of its existence when every detail had to be thought out and planned and every procedure tested and adopted with no precedents to follow, I feel, I have a claim for special gratification at the celebration of its Silver Jubilee and I am extremely proud of it. And now as Head of the Department it is my duty and privilege to foster its expansion and make it a first class Research Institute in the South. Towards that end in view every one at the Institute should put his shoulders to the wheel and make the profession realise its ambition much earlier than it expects. Talent we have in plenty but enough funds and facilities are lacking and we hope to overcome these short-comings before long.

The Institute has a unique record of work but its prospect seems to be much brighter than its retrospect. Now I take this opportunity to congratulate the staff the past and the present for the good work they have done. God willing, we will dedicate this Institute to the best of its potentialities to serve the cause of the cattle wealth of our land.

‘Jai Hind’

(Sd.) D. PATTABIRAMAN,  
Director of Animal Husbandry,  
Madras.



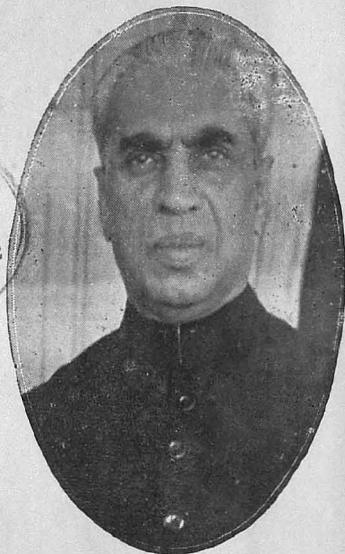


S. VANCHESWARA IYER  
*Superintendent I. V. P. M. Ranipet.*

# PAST SUPERINTENDENTS OF THE INSTITUTE



K. KYLASAM IYER



K. S. NAIR



L. A. SARMA

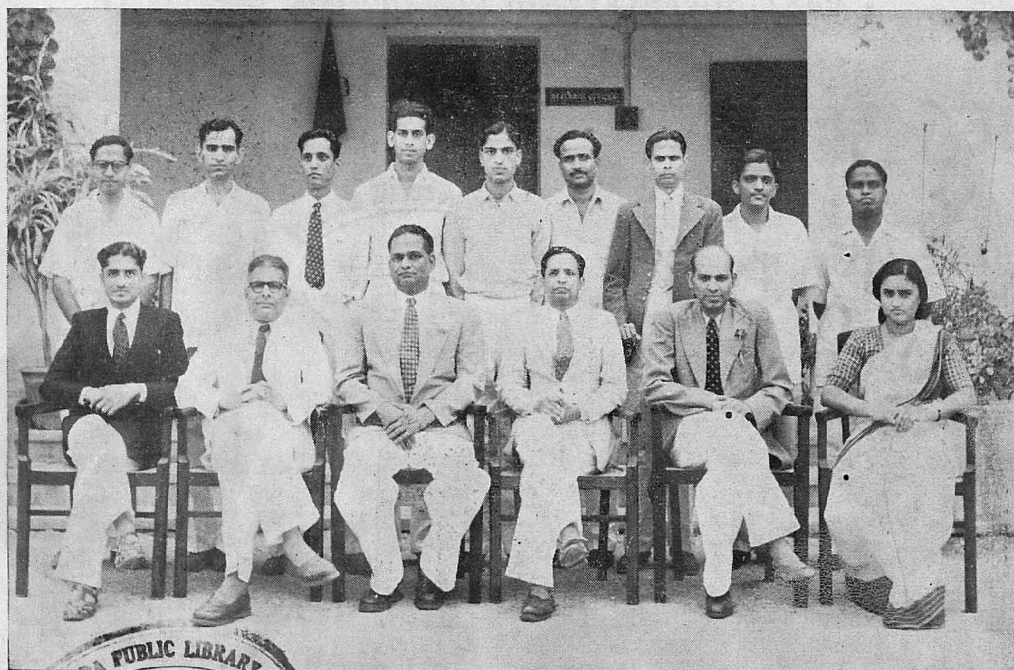


G. R. VISWANATHAN

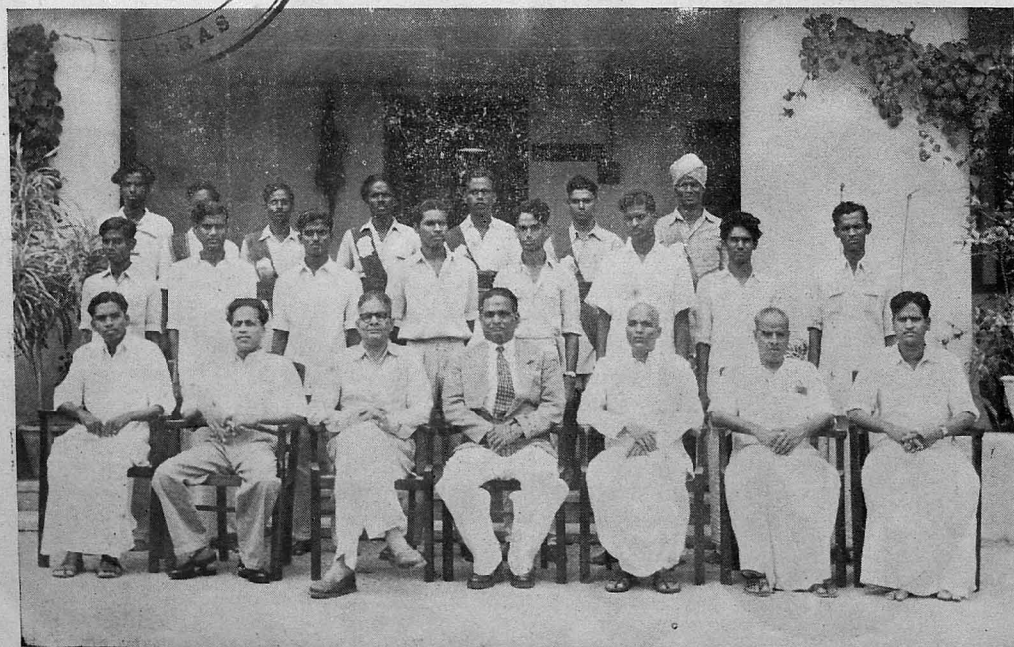


R. KRISHNAMURTHI

## TECHNICAL AND ADMINISTRATIVE STAFF



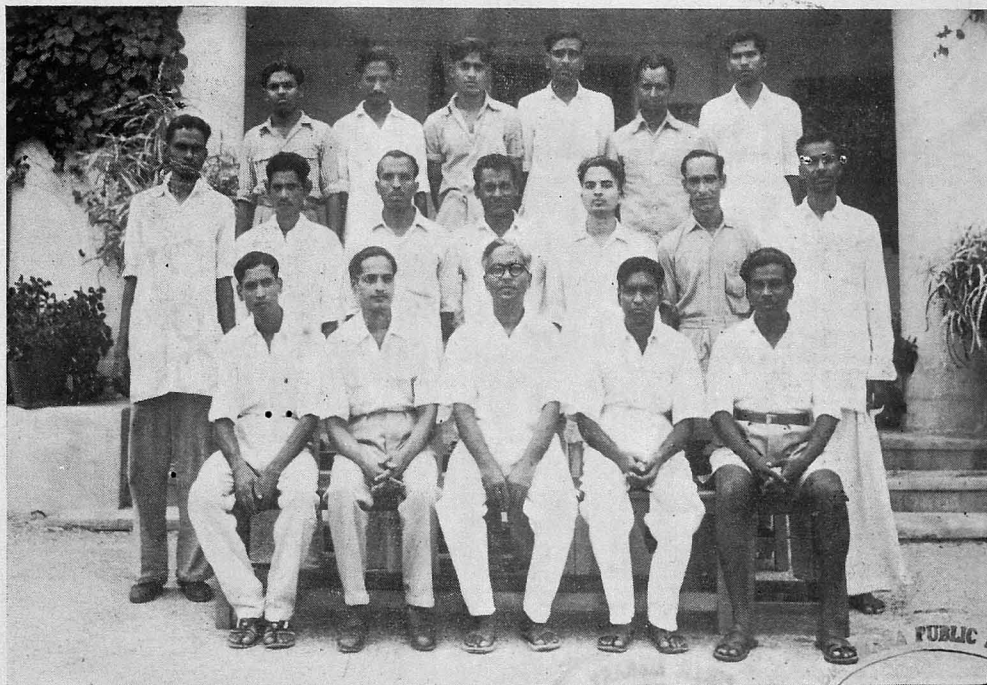
PROFESSIONAL STAFF



ADMINISTRATIVE STAFF

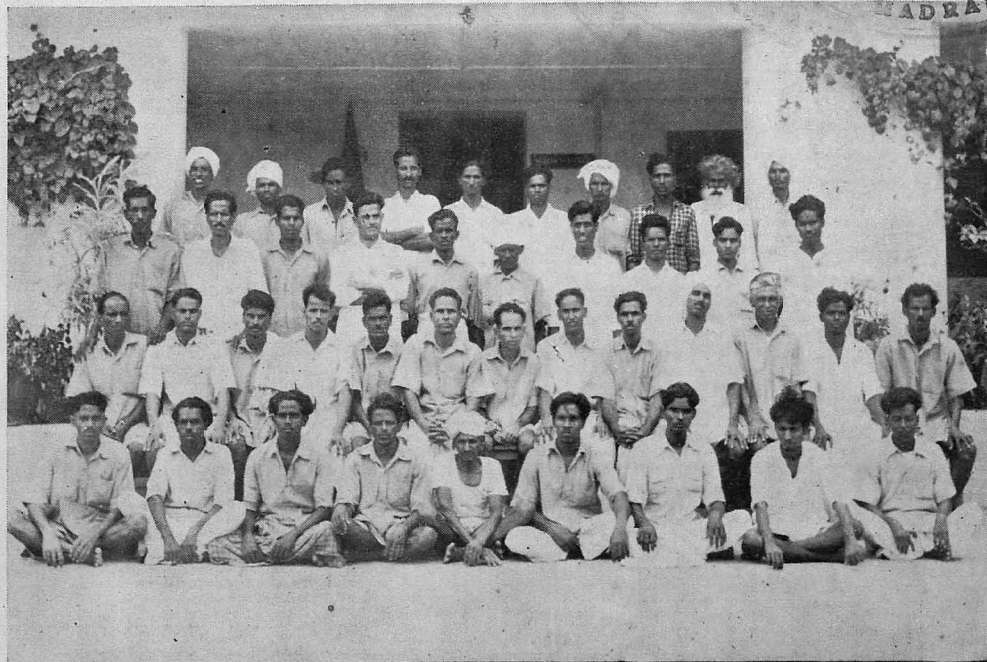


## LABORATORY ASSISTANTS AND MAZDOORS



LABORATORY ASSISTANTS AND ATTENDERS

17 NOV 1957



MAZDOORS

# *Succession list of Superintendents of the Institute*

---

1.	SRI K. KYLASAM AYYAR	...	...	...	7- 4-32 to 31- 7-35
2.	„ R. NARASINGA RAO	...	...	...	1- 8-35 to 18-11-35
3.	„ C. S. MURTHI	...	...	...	19-11-35 to 25-12-35
4.	„ K. KYLASAM AYYAR	...	...	...	26-12-35 to 1- 7-36
5.	„ C. S. MURTHI	...	...	...	2- 7-36 to 30-11-36
6.	„ K. KYLASAM AYYAR	...	...	...	1-12-36 to 7- 6-37
7.	„ C. S. MURTHI	...	...	...	8- 6-37 to 15-11-37
8.	„ K. KYLASAM AYYAR	...	...	...	16-11-37 to 15- 4-38
9.	„ C. S. MURTHI	...	...	...	16- 4-38 to 6- 7-38
10.	„ K. S. NAIR	...	...	...	7- 7-38 to 2- 9-40
11.	„ M. NOOR AHMED	...	...	...	3- 9-40 to 22-11-40
12.	„ K. S. NAIR	...	...	...	23-11-40 to 21-12-41
13.	„ L. A. SARMA	...	...	...	22-12-41 to 5-11-48
14.	„ S. VANCHESWARAN	...	...	...	6-11-48 to 10-12-48
15.	„ G. R. VISWANATHAN	...	...	...	11-12-48 to 31- 3-50
16.	„ I. M. AZIZUDDIN	...	...	...	1- 4-50 to 14- 6-50
17.	„ R. KRISHNAMURTI	...	...	...	15- 6-50 to 30- 7-51
18.	„ S. VANCHESWARAN	...	...	...	31- 7-51 onwards.

---

# Staff of the Institute

<i>Superintendent</i>	...	...	...	SRI S. VANCHESWARA IYER, G.M.V.C., M.S. (Mich).
<i>Research Officer</i>	...	...	...	„ K. S. GOPALAKRISHNAN, G.M.V.C.
<i>Special Officer (Freeze Dried Vaccines)</i>	...	...	...	„ S. SHANMUGHAM, G.M.V.C.
<i>Research Officer (Virus Vaccines)</i>	...	...	...	„ K. RAMANI, G.M.V.C.
<i>Research Officer (Brucellosis)</i>	...	...	...	„ R. SRINIVASAN, G.M.V.C., B.V.SC.
<i>Veterinary Assistant Surgeon</i>	...	...	...	„ S. SUNDARAM, B.V.SC.
<i>Do.</i>	...	...	...	„ T. SUBRAMANIAM, B.V.SC.
<i>Do.</i>	...	...	...	„ D. V. RANGA RAO, B.V.SC.
<i>Do.</i>	...	...	...	„ C. N. SUBRAMANIAM, G.M.V.C., B.V.SC.
<i>Do.</i>	...	...	...	„ B. PURUSHOTHAMAN, B.V.SC.
<i>Do.</i>	...	...	...	„ N. NAGANATHAN, B.V.SC.
<i>Do.</i>	...	...	...	„ R. KUMAR, B.V.SC.
<i>Do.</i>	...	...	...	SMT. ANNAMMA JACOB, B.V.SC.
<i>Do.</i>	...	...	...	SRI S. SUNDARARAJAN, B.V.SC.
<i>Do.</i>	...	...	...	SMT. K. KUMAR, B.V.SC.
<i>Do.</i>	...	...	...	SRI S. VISWANATHAN, B.V.SC.
<i>Do.</i>	...	...	...	„ V. S. GAJAPATHY, B.V.SC.

## Office Staff.

<i>Manager</i>	...	...	...	SRI K. S. SESHADRI.
<i>Head Clerk</i>	...	...	...	„ A. SANTHANAM.
<i>Accountant</i>	...	...	...	„ S. DORAISWAMY.
<i>Upper Division Clerk</i>	...	...	...	„ K. BALAKRISHNAN.
<i>Store-keeper</i>	...	...	...	„ G. VISWANATHAN.
<i>Clerk</i>	...	...	...	„ K. GOVINDARAJULU.
<i>Do.</i>	...	...	...	„ B. BALASKANDHA.
<i>Do.</i>	...	...	...	„ N. R. NARASIMHAN.
<i>Do.</i>	...	...	...	„ A. SOOSAI.
<i>Typist</i>	...	...	...	„ S. T. KUPPUSWAMY.

## Staff of the Veterinary Disease Investigation Section.

<i>Veterinary Disease Investigation Officer (Poultry).</i>	SRI A. R. MADHUSUDHAN, G.M.V.C.
<i>Veterinary Disease Investigation Officer (Cattle).</i>	„ V. VENKATARAMAN, G.M.V.C.
<i>Veterinary Disease Investigation Officer (Sheep and Goats).</i>	„ K. ANANTHAPADMANABHAN, G.M.V.C.
<i>Assistant to the Veterinary Disease Investigation Officer (Cattle).</i>	„ DAVID JACOB, B.V.SC.

# Institute of Veterinary Preventive Medicine, Ranipet

S. VANCHESWARA IYER, G.M.V.C., M.S.

**Early History.**—The prosperity of an Agricultural Nation like India depends primarily on its good and healthy livestock and it is one of the important duties of the Animal Husbandry Departments in the States to protect and preserve them from the ravages of various contagious and infectious diseases. Prior to 1932, the biological products necessary for this purpose in the Madras State were being obtained from the Indian Veterinary Research Institute, Mukteswar, situated about 1,500 miles away from Madras. About this period, Rinderpest, the most serious of all cattle diseases, was raging in a severe form in many parts of the State taking a heavy toll of livestock and causing great economic distress to the ryots. It was found extremely difficult to get sufficient stock of Anti-Rinderpest Serum in time from the Indian Veterinary Research Institute to control these outbreaks promptly and hence the Government of Madras, considering the seriousness of the situation, decided to have the necessary serum manufactured at Madras itself. For this purpose, experimental studies were commenced at the Madras Veterinary College and finding that potent Anti-

Rinderpest Serum could be prepared here successfully, Government sanctioned in 1932 the establishment of a "Serum Institute" at Madras, as a temporary measure for a period of 3 years. A portion of the lands and buildings originally known as "Slater Hostel" in Perampur Barracks opposite to the Carnatic Mills was made available for the purpose. After carrying out some additions and alterations to make the buildings suitable for a Laboratory and providing necessary accommodation for housing livestock, etc., the Serum Institute was established in these buildings in July 1932, and Sri K. Kylasam Iyer, a Senior Officer of the Department was appointed as the first Superintendent. A staff of 7 Veterinary Assistant Surgeons, 9 attenders, 4 clerks, a carpenter and a number of peons and mazdoors were also sanctioned.

With the establishment of the Institute at Madras it was found possible to manufacture and supply sufficient quantities of Anti-Rinderpest Serum and Rinderpest Virus in time and at a cheap cost to control effectively the outbreaks of Rinderpest in the different parts of the State.

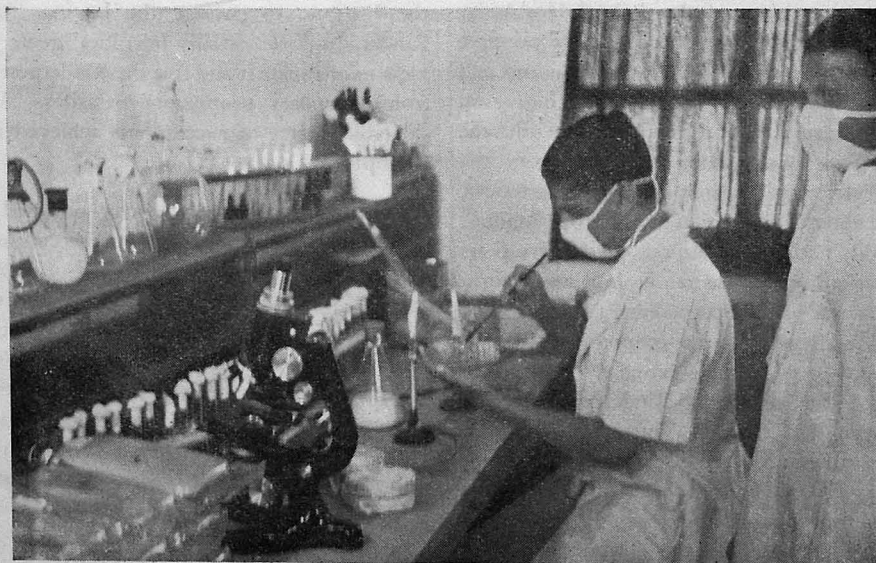
At this time, studies were also initiated at the Institute to passage the bovine strain of Rinderpest Virus serially into local goats with a view to attenuate it and free the Rinderpest Virus from secondary protozoan parasites. A considerable degree of success was achieved in this attempt.

Encouraged by the results obtained, the Government sanctioned in 1935 the continuance of the Institute for a further period of two years upto 31-3-1937 and also sanctioned the manufacture of Anti-Haemorrhagic Septicaemia Serum and Haemorrhagic Septicaemia Vaccine at this Institute for the control of Haemorrhagic Septicaemia among cattle and buffaloes in the State. Two more Veterinary Assistant Surgeons with necessary staff were posted for this purpose.

In order to arrive at a correct idea of the advantage to Government by maintaining this Institute, Government ordered in 1935 that pro forma cost and commercial accounts should



Entrance to the Institute.



A view of the laboratory



be maintained at the Institute and the manufacturing cost of each product worked out.

The Anti-H. S. Scrum and H. S. Vaccine manufactured at the Institute were also found to be quite potent and efficient and their manufacturing cost was found to be much lower than the prices prevailing at the Indian Veterinary Research Institute, Mukteswar and other places.

Encouraged by the results obtained and convinced of the economy and usefulness of maintaining this Institution, Government in 1937 extended its continuation for a further period of two years.

The manufacture of Anti-Rinderpest Serum, Rinderpest Bull Virus, Rinderpest Goat Virus, Anti-Haemorrhagic Septicaemia Serum and Haemorrhagic Septicaemia Vaccine was continued. To cope up with the increasing activities of the Institute and to provide additional accommodation for the laboratory and animals, the adjoining lands and buildings on the Cooks Road, belonging to the Labour Department were transferred to this Institute. The buildings were remodelled and equipped with necessary apparatus and furniture. Additional cold storage facilities were provided and more sheds were constructed to accommodate the large number of animals.

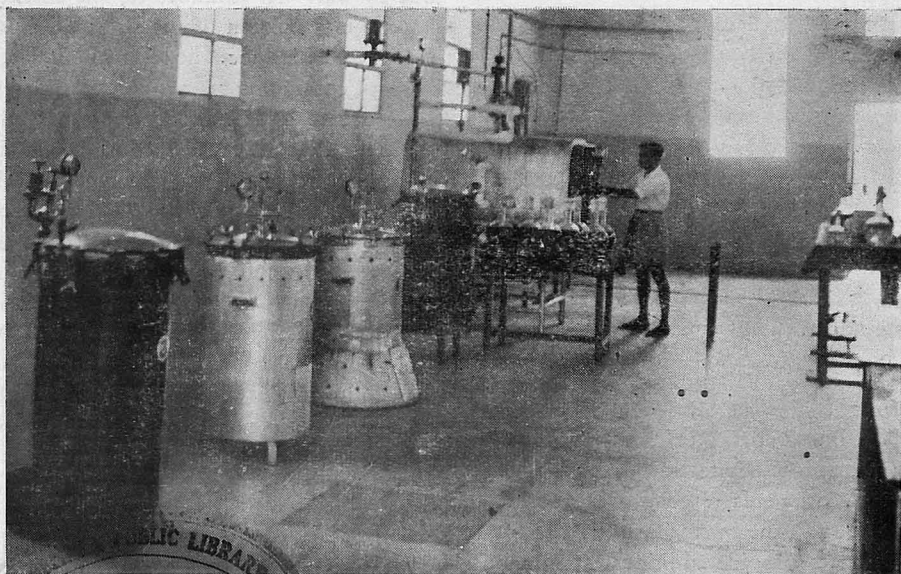
Government, convinced of the good and useful work carried out at the Institute and the economic benefits derived from it both by themselves and the livestock owners in the State, ordered its permanent retention in 1939.

In addition, Government sanctioned the manufacture of some more biological products like Anti-Black-Quarter Serum, Black-Quarter Vaccine, Bovine Lymphangitis Vaccine, Fowl Pox Vaccine, Fowl Cholera Vaccine and Fowl Cholera Serum. The manufacture of these products was taken up early in 1940 and the appointment of two more Veterinary Assistant Surgeons was sanctioned to cope up with this increased work.

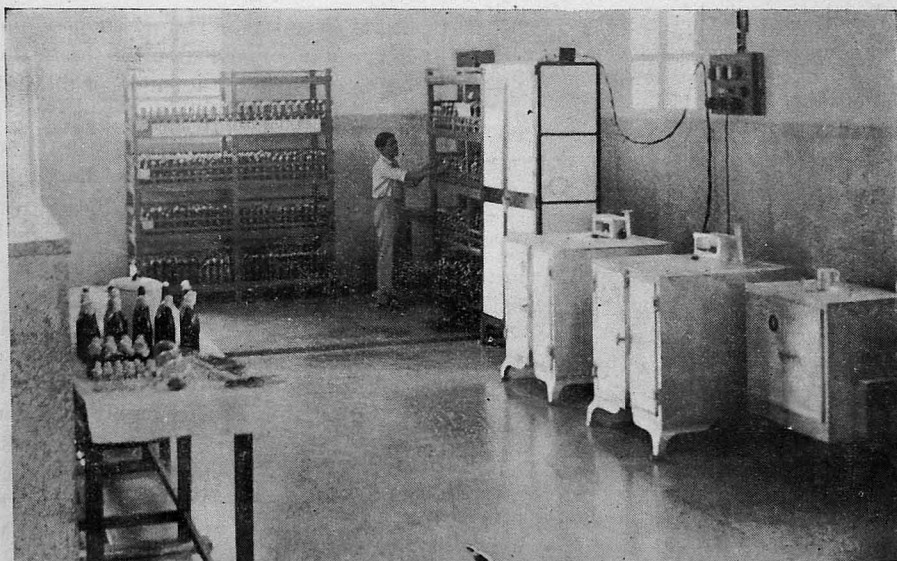
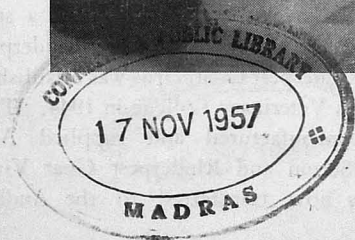
**Shifting to Coimbatore.**—In the early part of 1942, when the Institute was steadily expanding its activities and becoming more and more useful

to the livestock owners of the State, it had to be shifted to Coimbatore as an emergency measure due to war. At Coimbatore, the Institute was located in a portion of the Agricultural College estate, where it functioned for a period of nearly 6 years continuing its activities on a restricted scale due to limited accommodation and inadequate facilities. Repeated efforts made in this period to return to the original buildings at Madras or to have new buildings constructed in or around the City of Madras to house the Institute proved futile. The original buildings at Madras were sold to the Buckingham and Carnatic Mills by the Government of Madras. Coimbatore being located in one end of the State, some difficulties were experienced by the staff working in the northern parts of the State in getting timely supplies of Anti-Rinderpest Serum and Virus to control outbreaks of Rinderpest promptly. To overcome this difficulty, a sub-station for the manufacture of Anti-Rinderpest Serum and Rinderpest Goat Virus was established at the Madras Veterinary College in 1944. This sub-station manufactured and supplied Anti Rinderpest Serum and Rinderpest Goat Virus to the areas now transferred to the Andhra State.

**New Premises.**—The question of providing permanent accommodation for the Institute was engaging the serious attention of the authorities for a considerable time and when the present buildings at Ranipet originally constructed for a Meat Dehydration Factory by the Government of India became available, the State Government were pleased to acquire the same under the Postwar Reconstruction Scheme and the Institute was shifted to these buildings during March, 1948. The present premises has an area of about 100 acres of land with residential accommodation for the majority of the staff working in this Institute. The water supply to the premises is made by Messrs. Parry & Co., Ranipet. The Institute is situated in the place known as as Karai Maidan on the outskirts of Ranipet Town and is about 71 miles away from Madras. Since moving into the present premises, some additions and alterations were made to the main buildings to make it suitable for accommodating the different sections of the Institute. The land



Steam sterilizers



Hot air sterilizers

round about has been levelled and provided with a fencing and a number of trees have also been planted. Some additional furniture, equipments, cold storage facilities and a well equipped library with a number of periodicals and latest reference books have also been provided.

The Veterinary Disease Investigation Section consisting of three Gazetted Officers and their staff which was functioning at the Madras Veterinary College was transferred to Ranipet in the year 1948 and they were provided with necessary accommodation and facilities in the Institute buildings.

The sub-station at Madras was also closed and brought to Ranipet during the year.

After occupying the present buildings at Ranipet, in addition to manufacturing and supplying the different biological products in sufficient quantities, research studies were commenced to produce suitable vaccines for the control of Sheep Pox and Enterotoxaemia in sheep which were causing heavy economic loss to the people in the State.

Consistent with the nature of work carried on at the Institute, the name of the Institute was changed in 1950 from "Serum Institute" to "Veterinary Biological and Research Institute", Ranipet.

To cope up with the increased work due to the expanded activities of the Institute, a post of Research Officer was created in the year 1951, to assist the Superintendent in the administration, manufacture of biological products and cognate research activities.

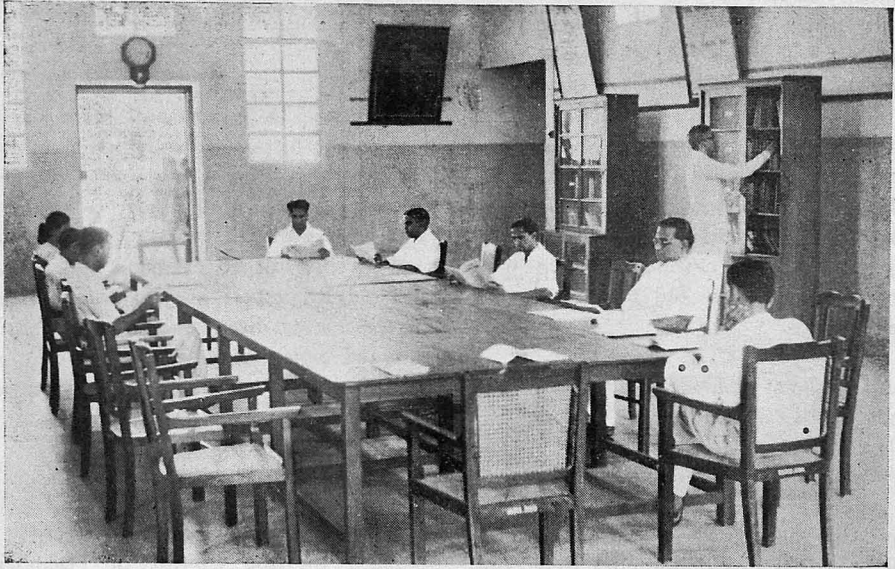
**Research Activities.**—With the appointment of the Research Officer, work on the research side was intensified and studies commenced on (1) the experimental manufacture of Anti-Anthrax Serum and Anthrax Spore Vaccine for the control of Anthrax among livestock, (2) preparation of Brucella Abortus Vaccine and antigens for the diagnosis and control of Brucellosis among cattle and (3) the manufacture of chick embryo adopted Fowl Pox and Pigeon Pox

Vaccines for the control of Fowl Pox among poultry. Considerable success was achieved in these items of work and the laboratory and field trials with the products evolved proved highly satisfactory.

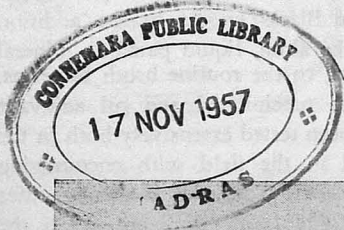
Simultaneously, experiments were started to adopt the local strain of Rinderpest Bovine Virus to rabbits, to produce a mild, cheap and efficient vaccine for the control of Rinderpest in the State. Great success was achieved in this work and it has been possible to evolve a new strain of Lapinised Rinderpest Vaccine at the Institute. This vaccine has been tested on local breeds of cattle and buffaloes and found to be quite safe and potent. The product has to be tested on foreign breeds of cattle and animals highly susceptible to Rinderpest.

As a result of further research studies carried out, improved and potent vaccines have been produced for the control of Haemorrhagic Septicaemia and Black-Quarter, by the addition of adjuvants like alum, liquid paraffin, mineral oil, lanolin, etc., to the routine broth bacterins. The H.S. alum precipitated and oil adjuvant vaccines have been tested extensively both in the laboratory and in the field with encouraging results. These new adjuvant vaccines confer a much better and lasting immunity than the broth vaccines in use hitherto. The alum added Black-Quarter Vaccine is also found to have high immunising qualities, as compared to the routine vaccine in use. A vaccine for the control of Johne's disease in cattle has been prepared at the Institute and is under experimental study.

**F.A.O. Assistance.**—During 1952, the Food and Agriculture Organisation of the United Nations provided this Institute with the services of an expert, Mr. G. G. Alton, for manufacturing Rinderpest and other Virus Vaccines in a freeze dried form and to train the staff of this Institute on the modern methods of vaccine manufacture. They in addition supplied this Institute with a freeze drying machine and other equipments costing about Rs. 30,000 necessary for the freeze drying of vaccines and for carrying out research. With the help of this expert and the equipments supplied, the manufacture of the different virus



Library of the Institute



Small animal house



vaccines for Rinderpest, Ranikhet Disease, Fowl Pox and Sheep Pox in freeze dried form using modern methods and technique was commenced at this Institute and these vaccines are now supplied to the field staff in the freeze dried form only. The production of these vaccines in this form has resulted in considerable economy as their bulk is much reduced, making it easy for storage and transport and in addition, has also improved its keeping qualities, as it could be stored in a deep freeze cabinet at  $-20^{\circ}\text{C}$  without loss of viability for a period of over two years. The F.A.O. expert worked in the Institute for a period of 15 months and trained the members of the staff in the handling of the freeze-drying equipments and manufacture of vaccines using modern methods and technique.

After the termination of the expert's assignment, a post of Special Officer for the manufacture of Rinderpest and other Virus Vaccines in the freeze dried form was created in 1954.

During this year the name of the Institute was again changed from "Veterinary Biological and Research Institute" to "Institute of Veterinary Preventive Medicine, Ranipet."

In February 1954, the Ranikhet Disease Vaccine Section which was functioning at the Madras Veterinary College was transferred to the Institute with the staff, equipments and a poultry unit and subsequent to this, the Ranikhet Disease Vaccine is being manufactured and supplied to the staff in the freeze dried form in the place of the liquid vaccine supplied hitherto from the College.

To facilitate further research work and to accommodate the animals under different experiments and tests, a few more equipments, a dozen isolation sheds and an animal house for breeding and rearing small experimental animals like rabbits, mice, guinea pigs, etc., were added on. The room where freeze drying work is carried out was air-conditioned to improve the efficiency of the machines and the products manufactured. The construction of an incubator room has been sanctioned by the Government and the work is expected to be taken up shortly. Quite recently,

the facilities at the Institute have been improved by the addition of a steam generator (boiler) and a horizontal steam sterilizer. The Institute is now fairly well equipped for manufacturing almost all the biological products necessary for controlling the various epidemics of livestock in the State and also for undertaking research in this direction.

Besides meeting the demand of the staff of the Animal Husbandry Department in Madras and Andhra States, the biological products manufactured at this Institute have also been supplied to other States in the Union like Bombay, Uttar Pradesh, Madhya Pradesh, Mysore, Kerala and Pondicherry and other places like Ceylon.

The biological products prepared at this Institute are supplied to the staff of the A. H. Department in Andhra State on a no-profit-no-loss basis as per Section 60 of the Andhra Partition Act from the date of partition on 1-10-1953.

During the disastrous cyclone of 1955, which hit the four districts of Tanjore, Tiruchirappalli, Madurai and Ramanathapuram, the Institute manufactured and supplied large quantities of Haemorrhagic Septicaemia and Black-Quarter Vaccines to protect the cattle of these districts from Haemorrhagic Septicaemia and Black-Quarter and saved them from these diseases.

**I.C.A.R. Schemes.**—The following three research schemes partly financed by the Indian Council of Agricultural Research are in progress at the Institute :—

(1) Scheme for the improvement of Haemorrhagic Septicaemia Vaccine and the manufacture of a combined vaccine for Haemorrhagic Septicaemia and Black-Quarter.

(2) Scheme for the improvement in the technique and methods used for the manufacture of Virus Vaccine.

(3) Scheme for the survey and control of Brucellosis in Madras State.

During the first Five Year Plan period, the Institute manufactured and supplied freeze dried Rinderpest Vaccine for use in the area covered

by the Pilot Project and it is one of the centres for the manufacture and supply of freeze dried Rinderpest Goat Tissue Vaccine for use under the National Plan for Rinderpest eradication in the country.

For convenience of working, the Institute has a number of sections, each section preparing biological products for the respective diseases and undertaking research on the manufacture of improved and new products.

**Achievements.**—From a modest beginning in 1932, commencing with the manufacture of Anti-Rinderpest Serum and Rinderpest Virus, this Institute has gradually developed and expanded its activities in the course of the last 25 years and is now fairly well equipped with the necessary buildings, apparatus, equipment, facilities and staff to undertake research work on the different animal diseases and the manufacture of suitable biological products on modern lines for their prompt and effective control.

The control of the major contagious and infectious diseases of livestock is no more a great problem in the State as this Institute is now manufacturing necessary biological products for the purpose and by the timely use of these products in endemic areas, the valuable livestock can be saved from the ravages of these diseases and the livestock owners saved from the economic loss.

Madras State has been free from Rinderpest for the last four or five years and this is not a little due to the prompt and timely supply of necessary biological products from this Institute.

It has been the constant endeavour of the institute to strive for the manufacture of quality biologicals to protect and preserve the livestock of the State from the ravages of the different contagious and infectious diseases.

Financially, the establishment of this Institute has proved to be a very sound one, as almost all the products required for use in this State are now manufactured economically and at a much cheaper cost than the rates prevailing in similar institutions in the country.

The cost of manufacture of each product is worked out annually on a pro forma commercial basis and the financial savings to Government worked out each year by the Accountant-General, Madras. It will be seen from the statement attached that considerable savings have resulted to Government from this Institute and the Institute has been run on the most economic lines.

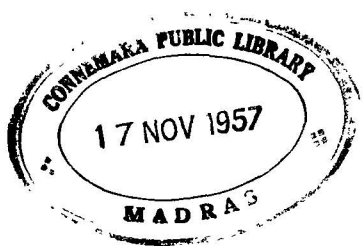
Due to the ready availability of necessary biological products at the Institute, it has been possible for the Animal Husbandry Department of the State to effectively control the various contagious and infectious diseases of livestock promptly and to forge ahead with ambitious plans for the development of livestock in the State in the Second Five Year Plan period.

The Institute is one of the centres of attraction for visitors and students from different institutions in and around Ranipet and they visit the Institute in the course of their educational tours. The final year students of the Madras Veterinary College and the Veterinary Surgeons of the Department undergoing Post-graduate course spend some time in the Institute to acquaint themselves with the activities carried on here.

The present staff of the Institute consist of a Superintendent, four Research Officers, ten Veterinary Assistant Surgeons, one Office Manager, seven ministerial staff, a mechanic, an electrician and a number of Laboratory Assistants, attenders and peons.

# STATEMENT SHOWING THE SAVINGS TO GOVERNMENT FROM 1932—33 TO 1956—57.

Year.			Probable expenditure if obtained from Mukteswar.	Amount spent in the Institute.	Savings.
			Rs.	Rs.	Rs.
1932-33	...	...	1,25,408	86,320	39,088
1933-34	...	...	2,38,068	95,601	1,42,467
1934-35	...	...	1,82,033	81,130	1,00,903
1935-36	...	...	1,63,929	76,843	87,086
1936-37	...	...	2,49,566	94,642	1,54,924
1937-38	...	...	2,84,309	95,612	1,88,697
1938-39	...	...	2,94,078	87,737	2,06,341
1939-40	...	...	2,80,738	73,593	2,07,145
1940-41	...	...	4,36,575	86,041	3,50,534
1941-42	...	...	3,95,841	80,933	3,14,908
1942-43	...	...	2,19,871	58,255	1,61,616
1943-44	...	...	5,60,618	1,23,668	4,36,950
1944-45	...	...	5,28,908	1,62,712	3,66,196
1945-46	...	...	4,69,264	1,35,431	3,33,833
1946-47	...	...	4,97,212	1,36,135	3,61,077
1947-48	...	...	3,09,750	1,07,246	2,92,504
1948-49	...	...	2,98,915	1,13,158	1,85,757
1949-50	...	...	5,26,185	1,76,063	3,50,122
1950-51	...	...	4,31,053	1,65,705	2,65,348
1951-52	...	...	6,50,857	2,54,221	3,96,636
1952-53	...	...	5,45,192	2,35,914	3,09,278
1953-54	...	...	4,05,431	1,60,217	2,45,214
1954-55	...	...	5,33,705	1,11,071	4,22,634
1955-56	...	...	9,44,307	1,50,155	7,94,152
1956-57	...	...	6,90,616	1,61,314	5,29,302



# Rinderpest and Its control in Madras

DR. D. PATTABIRAMAN, G.M.V.C., A.I.D.I.,

*Director of Animal Husbandry, Madras.*

"The history of cattle murrain in the Madras Presidency is peculiarly interesting, because of the early notices which exist regarding cattle plague, because in recent times the Madras Government took the initiative in investigating the subject and stimulated an interest in the matter which has borne abundant fruits in other parts of India, because, here, a skilled agency was first employed to inquire into the subject and devise measures for the prevention and treatment of disease causing mortality among cattle, because a legislative enactment was devised for these purposes and because after three years' experience and continued attention to the subject by professional men and district officers, the application of the enactment so devised was authoritatively declared to be neither expedient nor necessary, and stamping out limitation and treatment of murrain were entrusted to the knowledge, the personal efforts and influence of individuals". (Extract from the report of Indian Plague Commission, 1871.)

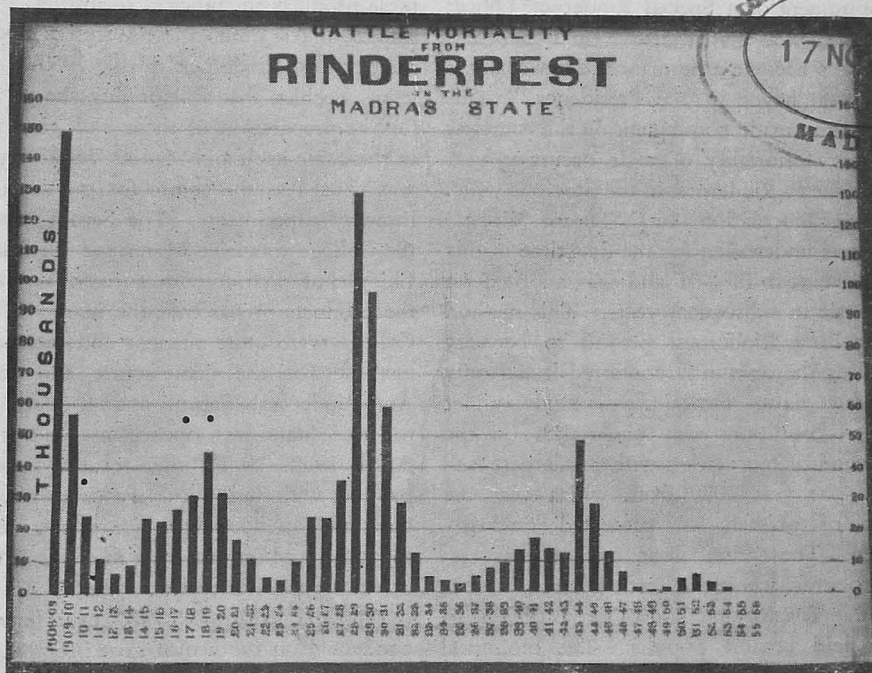
"Rinderpest" otherwise known as "Cattle Plague" had been prevailing in this country over a very long period. The subject of Rinderpest and its prevention engaged the attention of the

authorities from time to time and since the submission of the report of the Indian Cattle Plague Commission in 1871, much valuable work has been accomplished in the field of research on Rinderpest prevention.

Of all the contagious and infectious diseases affecting livestock, Rinderpest is the most dreaded disease, because it is the single disease that accounted for nearly 50% of the total annual cattle losses in the past. On an average about 25,000 head of cattle died of this disease in this State and the economic loss due to this disease is estimated to be about Rs. 50 lakhs annually. For an appreciation of the position of Rinderpest in the State, and the silent and creditable work carried out by our field staffs, it will do well to scan through with rapidity the history of the disease in the past 50 years. The years 1907 to 1909 and again 1929 to 1931 saw high mortality through this disease, i.e., 149,000 head of cattle were lost in 1908-1909; and 128,000 heads in 1928-29. In 1930-31 the recorded mortality was 59,323 and, 1931-32 nearly 23,462 head of cattle were lost in the State. The incidence of Rinderpest thereafter records a slow drop through the years 1933-34 to 1936-37 and again rose in 1937-38 and reached its peak in 1943-44—1944-45, when deaths were recorded as 43,836 and 29,084 respectively. Thereafter, the incidence and mortality shrunk to their lowest in 1948-49, there being 198 outbreaks and 636 deaths. The year 1950-51 recorded 523 outbreaks with 4,463 deaths, while in 1951-52 there were 851 outbreaks with 8,119 deaths and in 1952-53, there were 3,519 deaths. As a result of intensive mass inoculation campaign the disease has not made its appearance in this State since 1953.

If the above epizootology of Rinderpest is plotted out, it presents a wavy curve, with its crests appearing at intervals of about 10 years. These crests, mark the years when the epizootic assumed the highest proportions, occurring here, here and everywhere. This rhythmic frequency of the disease offers an explanation for what is actually called the herd immunity which is followed by an outbreak. The virus of Rinderpest is very fragile and does not live outside the





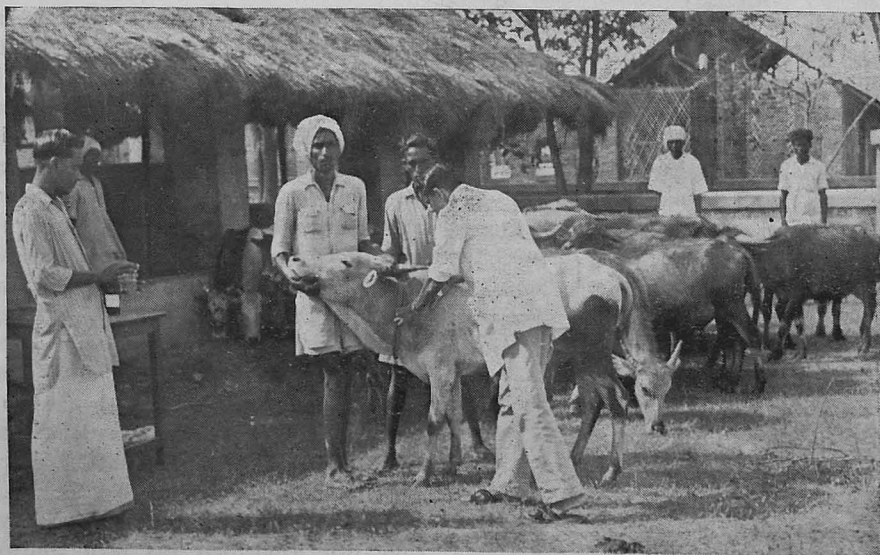
Rinderpest Mortality Chart (1908—54)

body for a great length of time. It cannot also multiply in the soil and for its survival it requires a living animal. Thus it seems, the only way the virus can exist is by the continuous close contact with susceptible animals and through carriers. Therefore in a given cattle population if there happens to be a proportion of resistant cattle, either artificially or naturally made resistant, continuity of the spread is interrupted and the virus gets smothered out of existence. This amounts to reason that in an outbreak of Rinderpest, there is the varying degree of susceptibility in individual animals in any herd. Some are highly susceptible, others partly susceptible while some are resistant. Hence whatever may be the degree of susceptibility, the recovered ones from the disease will acquire a solid immunity for the rest of their lives. These animals which survive after the disease, interrupt the continuity of the spread of infection, but as the new progeny are born in the area the susceptibility to the disease increases. From the plotted graph, it has been observed that the crests

appear at an interval of about 10 years. This can be attributed to the progenies of two or three generations born in the area, during the intervening period of about 9 years, resulting in the shift of the index or a threshold of immunity from the right resistant to the left susceptible, indicating a susceptible population for another wave of the epizootic to gain its foothold unless preventive measures are taken to keep off the infection. This indicates that if the herd can be artificially made immune subsequent infection in the herd can be avoided. It has been the observation of many that when the herd immunity is raised to 25%, it makes little impression on the course of the epizootic, whereas when the herd immunity is raised to 40% the epizootic picture is changed to enzooticity and if the herd immunity is still raised to 50% or more it assumes sporadic proportions and if raised to over 60 to 70% the epizootic is completely lost. It is only on the above principle that Rinderpest has been controlled in this State and eradicated ultimately.

During the year 1930, when the proposal for the appointment of a Special Rinderpest Officer was made, it was stated that "Rinderpest has more or less become a permanent disease and is causing great havoc in the Presidency." This statement was made consequent on the simultaneous heavy mortality of cattle occurring year after year due to Rinderpest in the previous years. Preventive inoculation by "Serum alone" method was undertaken for the first time in this State in the year 1900-01 and was adopted on a large scale in subsequent years. This method of controlling Rinderpest proved to be very doubtful as the immunity conferred lasted only for a few days. Experimental study under controlled conditions was undertaken on the S.S. method of inoculation with Rinderpest Bull virus in the year 1920 from which year the number of animals so protected gradually increased. The serum alone method was restricted to areas, where the Cattle Disease Act was enforced. The S.S. method of protecting cattle in the field became popular. The biological products required for this purpose were obtained from the Indian Veterinary Research Institute, Mukteswar, at enormous cost and considerable difficulty was experienced to get these products from a very long distance as it was time consum-

ing and there was also no regular supply of these products in sufficient quantities. This has resulted in less number of preventive inoculations done against Rinderpest during 1930-31. Hence it was decided that a beginning should be made for the preparation of these biological products in this State itself and Madras Veterinary College was chosen as the centre for carrying out preliminary experiments. The Serum produced at the College was tried by me for the first time in Chingleput district with successful results. As the products prepared at the Madras Veterinary College were quite efficient and satisfactory, an institute for the manufacture and supply of Anti-Rinderpest Serum and Rinderpest Virus for this State was opened at Madras on 7th April 1932. Since the serum simultaneous method with bull virus was involving a high cost, and attended with some risks like protozoon complications other methods as a suitable substitute at lesser cost were tried. Accordingly, during the year 1932-33, experiments were conducted on the use of goat blood Rinderpest Virus alone in immunising cattle against the disease. This was tried in 10 villages of Madras area. It may be worth mentioning here that this experiment of using goat virus was also tried by me in Chingleput district. Although



Protecting Cattle against Rinderpest

the experiments conducted during the year indicated that cattle could be successfully immunised by this method of inoculation, no valid conclusions could be obtained. Hence the experiments were continued during 1933-34 also on a large scale. With a view to study the effect of goat blood virus alone method under field conditions, trials were conducted in districts differing widely in their climatic, geographical and other characteristics viz. Anantapur, Chittoor, Chingleput, South Arcot and Tanjore. The results during this year were recorded as encouraging. The experiments on the use of goat blood virus alone method were continued till 1935-36, when it was finally found out that although the percentage of mortality by this method was negligible, yet it was not popular with the ryots as the Serum Simultaneous method, owing to a larger percentage of animals being incapacitated for work for a few days after vaccination due to reactions. The question of introducing a milder and more suitable product as a substitute for goat blood virus was therefore considered. In this connection during the year 1936-37 different methods of goat spleen tissue vaccinations were tried and the results obtained did not admit of any definite conclusions as it produced severe reactions in some of the animals. It was observed during the year 1937-38 that a wider use of a new glycerinated goat spleen tissue product was made, but the reports received from the District Veterinary Officers on their experience with this product showed that the immunity conferred on the animals was found on subsequent tests to be doubtful. So it was considered safe to use the goat blood virus with a simultaneous injection of Anti-Rinderpest Serum in a dose just sufficient to prevent any undesirable reactions. It was also expected that a considerable economy in Serum will result in the adoption of the Serum Simultaneous method using goat virus in substitution of old Serum Simultaneous method using bull virus. In the mean time field trials were also conducted on the Rinderpest Goat Spleen Tissue Vaccine (Saline) and with desiccated goat spleen vaccine. Since the reactions produced by these, were observed as too obscure, the Serum Simultaneous method with goat blood virus was finally decided in the year

1941-42 as a method of choice for preventive inoculation against Rinderpest. This method of protecting cattle against Rinderpest continued till 1954-55, when the freeze dried goat tissue Rinderpest Vaccine (Powder) was manufactured at the Institute of Veterinary Preventive Medicine, Ranipet and supplied to the field staff for protecting livestock against the disease. This product at present is found very useful for use both in the infected and free areas and there is a great demand for the product from other States such as Andhra, Sourashtra, Kutch, Junagadh, Bhavnagar, etc.

Rinderpest to-day is eliminated from this State. It was seen that in spite of the preventive inoculations being continued year after year, the mortality due to Rinderpest was always high till 1952-53, but while analysing the mortality by districts, the spread of infection was more or less confined to Bellary, Anantapur, Kurnool, Krishna, East and West Godavari and Visakhapatnam which are at present in Andhra State, while the Southern districts of the composite State were free from the disease except for a few sporadic infection here and there. It was confirmed that the infection of Rinderpest in the Northern districts which are at present in Andhra State, was due to large assemblage and movement of cattle for trade and also for extensive inter-State forest grazing. Hence it was decided then that unless strict preventive measures were enforced in the affected frontier districts, there would be always a threat to clean areas in the south. As per the above principle, it was proposed to have inoculation camps at cattle routes and mass immunisation of cattle in the frontier districts to raise the herd immunity so as to produce a higher threshold of resistance. Accordingly a mass inoculation campaign was started in this State and the frontier district of Vizagapatnam was almost covered by inoculating all the cattle with the enforcement of Cattle Disease Act. In addition intensive penta inoculation of cattle migrating for forest grazing was also done, which was crowned with success. All the scenes of outbreaks were promptly attended to by the field staff and not only all the cattle in the affected villages were protected but also in all the villages

surrounding the infected areas. The above concentrated efforts of the field staff in combating Rinderpest in this State, had resulted in less number of deaths due to Rinderpest in this State since 1948-49.

It was already stated that the Southern districts of this State were free from Rinderpest and only the Northern districts were having a few outbreaks of Rinderpest since 1948-49. When efforts were being made to free the entire State from Rinderpest, the separation of Andhra State took place in 1953. Hence it was decided that the present Southern districts which constituted the Madras State after separation and which were already free from the disease, should be safeguarded and kept free from infection. This could only be possibly done by establishing quarantine stations in the border areas of the neighbouring districts, where the inter-State movement of cattle took place. At this juncture it was gratifying to note that the Indian Council of Agricultural Research launched the Pilot scheme for "Rinderpest eradication" on an All-India basis. Since this State was already free from Rinderpest and since there was no need to conduct mass inoculation campaign, as this State had undertaken this earlier, the only need was to give effect to the proposal already made by opening quarantine stations in the border areas. Thus under the Pilot Scheme for Eradication of Rinderpest, 20 quarantine stations were opened on the land frontiers of this State, during the year 1954-55 in the districts of Chingleput, North Arcot, Coimbatore, Salem and South Kanara on all important cattle routes leading into this State from the neighbouring States. All animals entering the State were protected compulsorily with Freeze Dried Rinderpest Vaccine and were

also branded with standard "O" mark. The staff in these Quarantine Stations, in addition, undertook mass preventive vaccinations in the border areas. With the aid of these Quarantine Stations an immune belt against the disease has been created in the borders of this State.

Consequent on the re-organisation of States on 1st October, 1956, six Quarantine Stations; which were in South Kanara District were handed over to Mysore State and the remaining 14 Quarantine Stations functioned in this State till the end of February 1957. As Government of India were not prepared to share the expenditure beyond 28-2-57 on the ground that the Andhra State had created an immune belt on the Northern borders of Madras State, it was decided to close down all the quarantine stations in Madras State. But, however, considering the importance of possible infection by the movement of cattle from Andhra State, two quarantine stations on the most important cattle routes by which large number of animals enter into the Madras State had to be retained by the State Government. The field staff at present engaged in the control of cattle diseases have been instructed to keep a vigilant watch over the possibility of Rinderpest getting into the State and are also advised to take all preventive measures in time to ring out any possible infection. From the above it is clear that this department has been pioneer in eliminating this dreadful disease by the concentrated efforts in all directions. Though Rinderpest is still a world problem and it had always been and in fact still continues to be the important contagious animal disease in other States of the Indian Union, yet it is very creditable on the part of the departmental staff to have contributed their might for eradicating the disease from this State.





# Freeze Dried Rinderpest Goat Tissue Vaccine

S. SHANMUGHAM, G.M.V.C.

Freeze drying is one of the modern methods used for the preservation of sensitive biological materials like blood, plasma, viruses, living bacterial suspensions, vaccines, sera, etc., so that they may be kept in the natural state without loss of potency and viability for a long period. In freeze drying, the substances are dehydrated from a frozen state and the moisture in them which is detrimental for their existence for long periods is removed, so that the resultant dry product could be stored both in a refrigerator or outside for longer periods without being spoilt. The chief advantages of freeze drying are (1) the long viability of the product, (2) reduced bulk, (3) easy transport, (4) occupy less space for storage, (5) low risk of contamination and (6) easy reconstitution at the time of use in the field.

Of the different types of apparatus and plants that have been designed for commercial freeze drying, the Edward's Centrifugal Freeze Dryer model 3 P.S. is found to be very convenient and economical under laboratory conditions and these plants are used for freeze drying vaccines, etc., at this Institute. Freeze Dried Goat Tissue

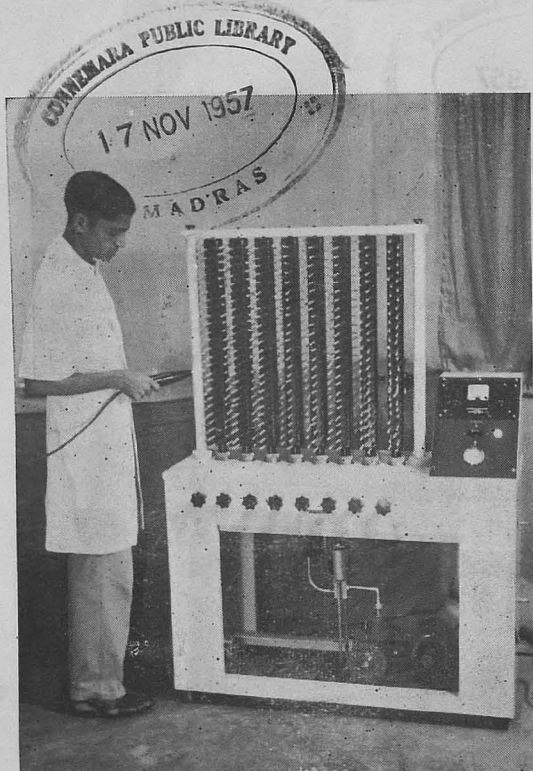


Freeze Drying Machine—Primary

Vaccine for the control of Rinderpest in cattle is now being manufactured at this Institute using the Edward's Centrifugal Freeze Dryer.

The method used for the control of Rinderpest in the Madras State till 1952 was by protecting the healthy animals with Rinderpest Goat Virus and Anti Rinderpest Serum in sufficient quantities to avert severe reactions in the vaccinated animals. Though this method of immunisation was quite satisfactory, due to the short viability of the goat blood virus, there were difficulties in maintaining regular supplies of fresh virus to distant areas and remote villages. In 1952, with the help of a Centrifugal Freeze Dryer and other equipments and an Expert provided by the Food and Agriculture Organisation of the United Nations it was possible to freeze dry and modernise the method of processing the virus so that it could be stored and used for longer periods without loss of potency.

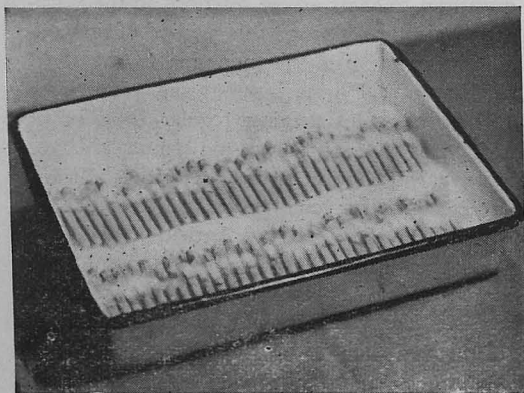
The 'W' line of Rinderpest Goat Virus obtained from Mukteswar, which was highly



Freeze Drying Machine—Secondary

antigenic and milder than the Madras strain and the Mutkeswar 'Y' line of Goat Virus which was in use hitherto for combating outbreaks of Rinderpest, was utilised for the preparation of the Rinderpest Vaccine in freeze dried form.

The spleen from goats infected with this strain of virus and which is rich in viral content was utilised in the preparation of this vaccine.



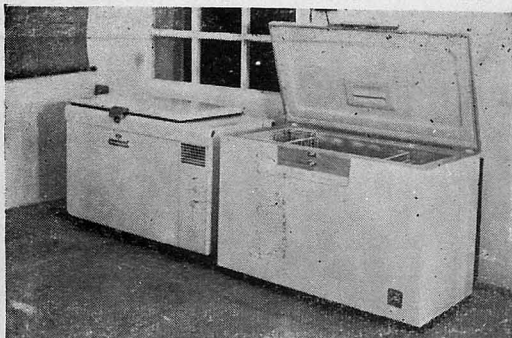
Ampoules of Freeze Dried Vaccine

Healthy, young goats are infected with this virus and at the height of reaction, the spleen from these are harvested aseptically and processed in the Centrifugal Freeze Dryer. This processing consists of two stages: (1) the primary drying in which the spleen pulp is frozen and dried in the frozen state itself using a high vacuum in which about 95% of the moisture from the materials is removed and (2) the secondary drying in which the remaining moisture is removed. After the primary drying, the dried spleen pulp is powdered nicely and after sieving filled into glass ampoules in quantities of 1/4th gram of powder. These ampoules after being subjected to the secondary drying are sealed in high vacuum and stored in the deep freeze cabinet at  $-20^{\circ}\text{C}$ . The whole process of freeze drying is carried out in an air-conditioned room maintained at  $65^{\circ}\text{F}$ .

A sample of the above vaccine is tested for sterility and safety and its titre determined by suitable titrations in buffalo calves. Normally the vaccine gives a titre of 1 in 16,000 indicating that each gram of the dry powder contains 16,000 infective doses and for use in the field, 40 such infective doses are used for protecting each animal. Hence one gram of this freeze dried spleen powder will be sufficient to protect 400 animals in the field.

The vaccine is found to keep well in a deep freeze cabinet at  $-20^{\circ}\text{C}$  for a period of about 2 years, in the freezing chamber of a household refrigerator or in ice for a period of about 3 months and at room temperature of  $90^{\circ}\text{F}$  for about a week. This vaccine was used extensively for controlling Rinderpest in the areas covered by the Pilot Project of the Rinderpest Eradication scheme of the First Five Year Plan, in the various quarantine stations established in the Madras State and also in the border villages of the State for creating an immune belt with very encouraging results.

It is now being used for protecting cattle in the Rinderpest Eradication Campaign launched by the Government of India in the Second Five Year Plan and the Institute of Veterinary pre-



Deep Freeze Units for Storing Freeze Dried Vaccine

ventive Medicine, Ranipet is one of the centres for manufacturing and supplying this vaccine for this purpose.

So far more than 80 lakhs of doses of this vaccine have been manufactured and supplied from this Institute.

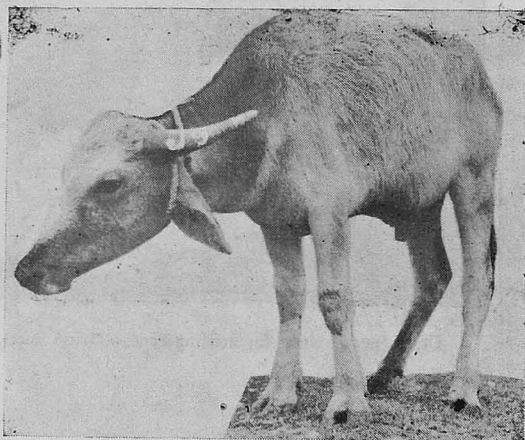


# Haemorrhagic Septicaemia & its Control

D. V. RANGA RAO.

Haemorrhagic Septicaemia of cattle and buffaloes is a highly infectious and fatal disease taking a heavy toll among them every year. In the Madras State this disease produces heavy economic loss running into 10 to 12 lakhs of rupees annually. The mortality rate among affected animals is rather high and is about 90%. The disease mostly lurks in the wet and marshy areas and places having heavy rainfall and flares up with the onset of monsoon rains. In the Madras State, this disease is endemic in the districts of Tanjore, Chingleput, South Arcot, Tiruchirapalli and Madurai though prevalent to a lesser extent in the other districts.

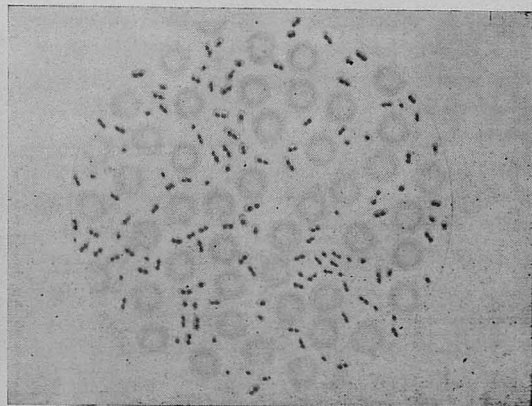
The disease is caused by a small (bipolar) organism known as "*Pasteurella bovisseptica*." The infection is picked up from contaminated food and pastures and in some animals the organisms which are normally present in the upper respiratory passages become pathogenic under conditions of lowered vitality. The chief symptoms of the disease are, rise of temperature, dullness, loss of appetite, salivation, oedematous swelling of the throat region and



Buffalo calf suffering from Haemorrhagic Septicaemia

dyspnoea. Due to the sudden onset, short course and the fatal nature of the disease, treatment is rarely successful. The control of the disease is therefore confined primarily to prophylactic vaccination and adoption of sanitary measures.

Prior to the year 1936, the antiserum and vaccine necessary for controlling the disease in the State were obtained from the Indian Veterinary Research Institute, Mukteswar. The antiserum was used for protecting animals in actual outbreaks of the disease and the vaccine in the neighbouring villages. The serum was prepared by hyper-immunising buffaloes with cultures of "*Pasteurella bovisseptica*"; and collecting



Blood smears from a calf showing *Pasteurella* organisms



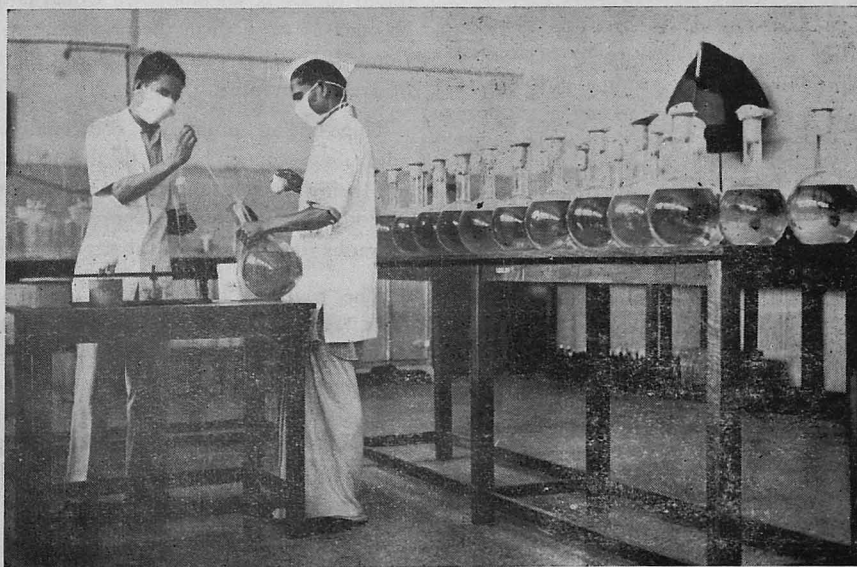


Some animals dead of Haemorrhagic Septicaemia

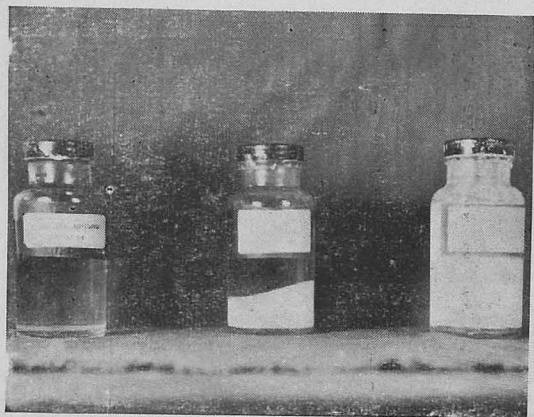
their blood when they are sufficiently immune. The passive immunity conferred by the serum was of a short duration lasting for about two weeks only and the serum inoculations had to be repeated if the disease continued in the herd after this period. During the year 1936, the manufacture of Anti Haemorrhagic Septicaemia

Serum and Haemorrhagic Septicaemia Vaccine was commenced at the Serum Institute, Madras.

The vaccine conferred an active immunity and was prepared by growing stock cultures of **Pasteurella bovisseptica** organisms in nutrient broth for 48 hours at 37° C and then inactivating



Seeding of flasks with H. S. organisms



Improved vaccines used for the control of Haemorrhagic Septicaemia

them by the addition of formalin to a concentration of 0.5%. The immunity conferred by this vaccine (though of a poor quality) was found to last for about six weeks and a number of outbreaks of Haemorrhagic Septicaemia were successfully controlled by using this vaccine.

Quite recently attempts were made at the Institute to evolve a better and more potent vaccine that would confer a strong and lasting immunity in the protected animals. It is common knowledge that virulent *Pasteurella bovisepctica* organisms from freshly isolated cases possess a capsule and this capsule is lost by frequent sub-culturing in the laboratory or by prolonged incubation. This capsular material is found to have high immunising value and virulent organisms possessing such capsules are termed as "Phase I" organisms. It was decided



Vaccination of cattle against Haemorrhagic Septicaemia

to prepare a vaccine using "Phase I" organisms and a broth vaccine thus prepared was found to have better immunising qualities than the one prepared by using the stock culture of the organisms.

Studies were made at the Institute to improve the immunising power of this vaccine further by the addition of adjuvants like Alum, Shell Ondina oil, Shell White oil, liquid paraffin and lanolin. The alum precipitated vaccine was prepared by adding alum to the broth vaccine to obtain a final concentration of 1%. A flocculent precipitate was thrown down and this was thoroughly shaken with the supernatant and injected subcutaneously into animals in doses of 5 c.c. This vaccine is found to be more potent than the broth bacterin in use hitherto and the immunity conferred by it is found to last for a period of 5 to 6 months.

An oil adjuvant vaccine has also been prepared at this Institute, by adding liquid paraffin or mineral oil and lanolin to a suspension of the bacterial cells collected by centrifuging the broth bacterin and mixing them thoroughly in a blender. This resulted in a viscid, creamy white emulsion which constituted the Oil adjuvant vaccine. This vaccine when injected intramuscularly into animals in doses of 3 c.c. is found to confer an immunity which is found to be much stronger than the one conferred by the alum-precipitated vaccine and lasts for a period of over ten months.

This lasting immunity conferred by these adjuvant vaccines is due to the fact that they are being retained in the tissues for longer periods thus providing a prolonged antigenic stimulus for continued antibody formation.

The routine broth bacterin in use hitherto has been replaced by the alum-precipitated vaccine. Experiments with the oil adjuvant vaccine with regards to its usefulness in the field for controlling outbreaks are in progress. 1,11,43,060 doses of Haemorrhagic Septicaemia Vaccine have been prepared and supplied from this Institute during the past seventeen years.

The availability of these two new adjuvant vaccines has given us a much-needed potent

weapon for the efficient control of Haemorrhagic Septicaemia among livestock in the State.

By the judicious use of these improved vaccines and using a well-planned campaign of vaccination of all susceptible animals in endemic

areas of the disease well in advance of the monsoon rains, the valuable livestock of the State can be saved now from this dreadful disease and the livestock development plans forged ahead with success.

**Statement showing the number of outbreaks, mortality, preventive inoculations conducted and the quantity of vaccine produced against Haemorrhagic Septicaemia.**

Year.		No. of outbreaks.	Mortality.	No. of inoculations performed.	Quantity of the vaccine produced (in doses).
1940-41	...	1,172	4,938	1,55,536	3,09,350
1941-42	...	1,390	5,248	1,24,116	2,96,950
1942-43	...	1,090	4,191	81,473	1,17,300
1943-44	...	1,346	5,898	1,22,129	2,18,710
1944-45	...	1,595	8,931	1,61,415	2,69,940
1945-46	...	900	6,530	1,46,507	2,82,840
1946-47	...	1,218	7,112	2,15,055	2,21,080
1947-48	...	1,298	7,759	2,26,864	4,59,670
1948-49	...	1,204	7,714	2,51,912	5,71,570
1949-50	...	1,594	8,039	3,84,432	6,30,620
1950-51	...	1,227	4,354	2,21,239	5,38,120
1951-52	...	965	6,008	2,34,008	4,69,180
1952-53	...	1,064	5,300	2,70,198	5,62,790
1953-54	...	458	2,249	1,06,880	5,86,550
1954-55	...	698	3,291	1,66,117	11,83,610
1955-56	...	997	4,952	4,30,885	22,44,780
1956-57	...	759	3,470	2,98,481	22,40,060



Animal dead of Blackquarter.

# Blackquarter and its Control In Madras State

C. N. SUBRAMANIAN.

Blackquarter is an acute infectious disease of cattle and is widely prevalent in the different parts of the State. This disease accounts for nearly 30 per cent of the annual mortality in the State due to contagious and infectious diseases and the yearly loss suffered by the ryots from this disease alone is expected to be about 12 lakhs of rupees. The disease affects mostly young cattle between the ages of 1 to 3 years and buffaloes and sheep are also affected occasionally. The chief symptoms of the disease are high fever, dullness, lameness of the affected limb and crepitating painful swelling in the muscular regions of the body like the hind quarters, thigh or shoulder. The dry interior districts of the State, particularly Coimbatore, Salem, North Arcot, South Arcot, Chingleput, Madurai and Ramana-thapuram are endemic areas for this disease and here the disease occurs year after year soon after the onset of the monsoon rains.

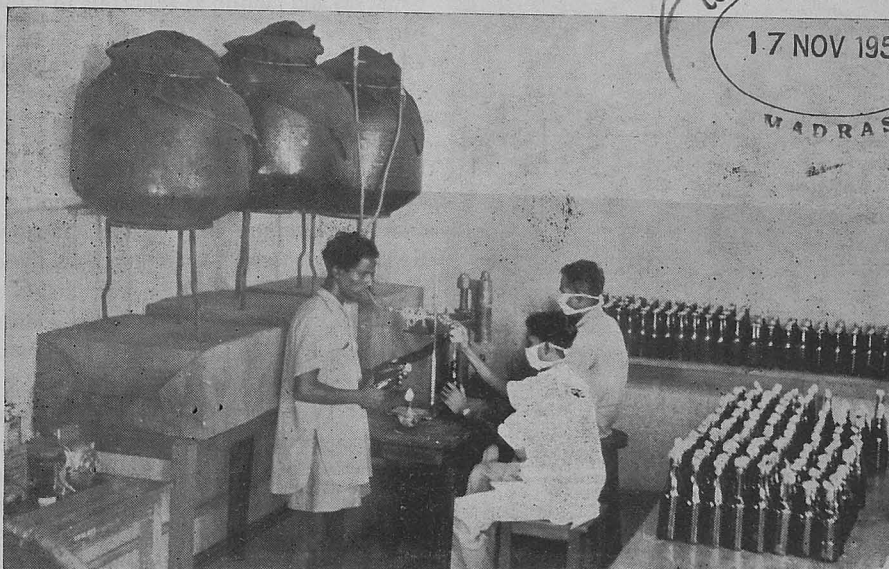
The infection is chiefly picked up, while grazing from pastures already contaminated with resistant spores of the Black-Quarter organisms and through wounds and abrasions. The improper disposal of affected carcasses in the

villages brings about reinfection of the already infected pastures and unless proper precautions are taken with regards to the proper disposal of infected carcasses, the disease is likely to recur in the same village year after year. Since it is very difficult to sterilise the soil and get rid of the infection, the only practical method of saving the valuable livestock in these areas is by carrying out timely vaccination of all susceptible livestock using suitable sera and vaccines, and adopting proper sanitary measures.

Nearly 90 per cent of the deaths due to Black-quarter in the State is found to be due to infection by *Clostridium chauvoei* and the rest by *Clostridium septicum* alone, or as a mixed infection.

Two biological products were used in this State for controlling outbreaks of Black-Quarter : (1) Anti Blackquarter Serum and (2) Black-quarter Vaccine. The Anti-Serum, due to the presence of antibodies in it, confers immediate protection and a passive immunity lasting about two weeks and was used in actual outbreaks of the disease for protecting animals in close contact with the affected ones. The vaccine confers an active immunity lasting for about 6 months and is used for protecting cattle in endemic areas of the disease. These two products were obtained from the Indian Veterinary Research Institute, Mukteswar, till the year 1940 and used in this State for controlling the disease with considerable success.





Filling of Bottles with Vaccine

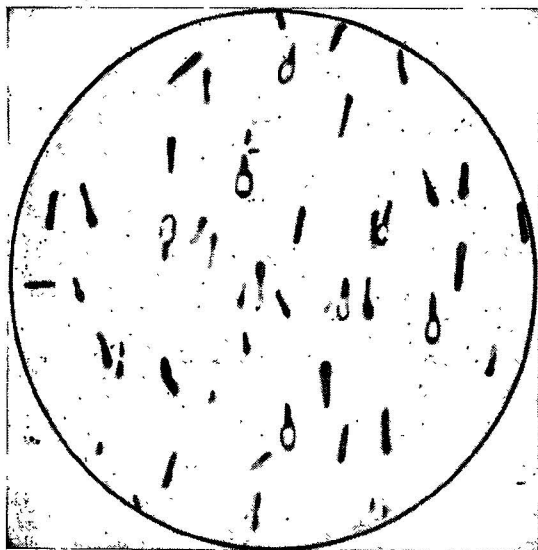
During the year 1940, experimental studies were commenced at the Serum Institute, Madras (now Institute of Veterinary Preventive Medicine, Ranipet) for the manufacture of these two products, so that they could be made available in sufficient quantities for controlling outbreaks of the disease promptly. The Anti-Serum and Vaccine produced at the Institute, using highly antigenic strains of *Cl. chauvoei* obtained from the Indian Veterinary Research Institute, Mukteswar, proved to be good and potent and from that year the manufacture and supply of these two products were made from this Institute. Subsequently, the manufacture and supply of the Anti-Black-quarter Serum was discontinued as it was found that the immunity conferred by the product is for a short period only and at the same time it was expensive. Further, it was found that many outbreaks of the disease could be successfully controlled by the prompt use of the vaccine alone, and the immunity conferred by it lasted from 6 to 9 months.

During 1950, the immunising value of the vaccine was improved by incorporating antigenic strains of *Cl. septique* also along with *Cl. chauvoei* in the vaccine and equal proportions

of both these organisms were used in the vaccine prepared and supplied from the Institute. In the subsequent years, studies were undertaken to introduce new and enriched media to obtain a luxuriant growth of bacterial cells to produce vaccines of higher potency and immunising value. The addition of chemicals like Cysteine hydrochloride and Sodium thioglycolate in certain proportions to the routine media were found to be very useful in getting a rich growth of the organisms and this simplified also the media used to a great extent. The vaccine produced from media prepared with the addition of these two chemicals was also found to be equally potent and efficient like the routine vaccine in use. But the two chemicals are a little expensive and at times unobtainable in the country.

In the year 1952, studies were made at the Institute to find out whether the addition of Alum as an adjuvant in a concentration of 1% to routine Black-quarter bacterin will improve its immunising value. The results obtained were very encouraging and showed that animals protected with the alum added vaccine were able to withstand a higher challenge dose with





The causative organisms (*Cl. chauvoei*)

adding mineral oil like liquid paraffin or Shell white oil and lanolin as adjuvants to a formalised bacterial suspension of *Cl. chauvoei* and *Cl. septicum* and its immunising value is under study at present.

Black-quarter appears to be a disease which can be effectively controlled by mapping out the endemic areas and carrying out annual vaccination of all susceptible livestock in these areas, coupled with the adoption of suitable sanitary measures with regards to the proper disposal of carcasses, dead of this disease. As an instance several villages in Coimbatore district which were once endemic areas for this disease, have now been freed from this disease as a result of carrying out timely vaccinations and the loss due to this disease practically eliminated in these places. Systematic vaccination of all susceptible livestock in the different districts of the State is being carried out now regularly as a policy of the department and it is expected that as a result of this, the losses due to this disease will be reduced to the barest minimum in the coming years. During the last 17 years 1,12,08,408 doses of Black-quarter Vaccine have been prepared and supplied to the field staff from this Institute.

virulent cultures of *Cl. chauvoei*. The concentration of the Alum precipitated vaccine by removing and discarding a portion of the clear supernatant fluid gave a vaccine more potent and with higher immunising power.

A new adjuvant vaccine has been prepared by

**Statement showing the particulars of outbreaks, mortality and quantity of vaccine produced against Black-quarter in Madras State during the past 15 years.**

Year.			Number of outbreaks.	Mortality.	Quantity of vaccine produced in doses of 5 c.c.
1940-41	...	...	985	4,688	1,79,050
1941-42	...	...	940	3,694	1,63,850
1942-43	...	...	1,658	6,539	1,79,150
1943-44	...	...	1,093	5,197	2,08,440
1944-45	...	...	947	4,109	1,81,564
1945-46	...	...	1,280	8,693	3,94,833
1946-47	...	...	1,790	10,598	5,82,269
1947-48	...	...	2,401	13,540	7,86,740
1948-49	...	...	1,296	7,301	4,76,292
1949-50	...	...	1,805	8,914	7,20,530
1950-51	...	...	1,514	6,896	5,65,860
1951-52	...	...	1,251	4,605	5,19,180
1952-53	...	...	700	2,890	3,29,010
1953-54	...	...	644	2,736	4,63,370
1954-55	...	...	1,505	6,390	14,50,520
1955-56	...	...	2,424	3,013	26,36,250
1956-57	...	...	742	2,671	13,66,500





**Anthrax Spore Vaccine**

fers an immediate protection and passive immunity lasting for about two weeks and is to be used in actual outbreaks of the disease for protecting the animals in close contact with the affected or dead animal. The spore vaccine confers an active immunity lasting more than 6 months and is to be used for protecting the livestock in places close to the area where the disease has occurred or in endemic areas of the disease.

In some districts, due to the bad practice of cutting open the carcasses of animals died of anthrax, frequently, the organisms persist in the soil and pasture and the disease becomes endemic, occurring year after year. In these villages, the periodical or annual vaccination of all susceptible livestock with the anthrax Spore Vaccine and proper disposal of animals died of anthrax by burying them deep under lime or cremating them, will eradicate the disease rapidly.

Until 1952, the Anti-Anthrax Serum and anthrax Spore Vaccine necessary for use in Madras State were obtained from the Indian Veterinary Research Institute, Mukteswar and Izatnagar. During that year experiments were commenced at the Institute of Veterinary Preventive Medicine, Ranipet, to prepare potent

anti-anthrax serum and anthrax spore Vaccine. The virulent strains of organisms required for this purpose were obtained from the Indian Veterinary Research Institute, Mukteswar and the Veterinary Research Laboratory, Wewbridge, England. The efforts proved successful and the anti-serum and spore vaccine are now manufactured and supplied from the Institute of Veterinary Preventive Medicine only, from that year. Both the anti-serum and spore vaccine prepared and supplied are found to be quite potent and useful for controlling successfully

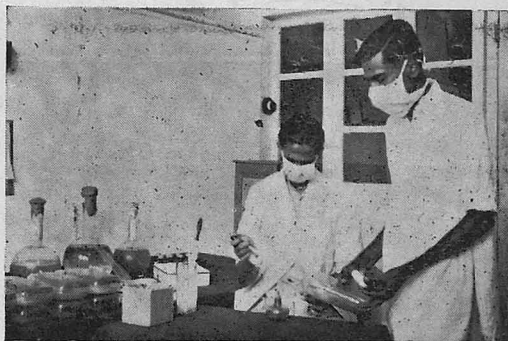
several outbreaks of the disease among livestock both in Madras and Andhra States.

Generally, the anthrax spore vaccine is found to produce when injected subcutaneously a sort of oedema and cellulitis in a small percentage of the sheep and goats resulting in death in a few cases. This unpleasant reaction has been eliminated now as a result of further studies carried out at the Institute and by administering the vaccine by the intracutaneous route in one of the caudal folds of these animals. The anthrax spore vaccine supplied from the Institute confers a good and satisfactory immunity in vaccinated cattle, sheep and goats lasting for a period of over six months.

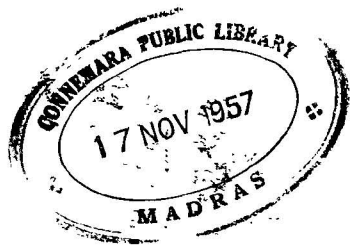
The spore vaccine is getting more and more popular among the staff in the Madras and Andhra States and the livestock owners, and the demand for it is increasing every day. It is a safe product and very seldom causes any unpleasant reaction or mortality in vaccinated animals.

The control of anthrax among the livestock in the State is no more a difficult problem. By the timely use of the anti-anthrax serum in

actual outbreaks of the disease coupled with proper disposal of carcasses and adoption of suitable sanitary measures, and the judicious and periodical vaccination of all susceptible livestock in the endemic villages with the anthrax spore vaccine, the disease could be effectively controlled in future years, thereby preserving the valuable livestock and public health of the State from this disease.



Preparation of anthrax Spore Vaccine (seeding of flasks)



# Brucellosis and its Control

R. SRINIVASAN.

The hardship and economic loss caused to the farmer by Brucellosis or contagious abortion in cattle have been known for a long time now. The disease is caused by the germ "**Brucella Abortus**" and it attacks the farmer's economy in many ways. Apart from heavy loss of valuable calves, due to frequent abortions it causes sterility in those cows, decrease in their milk yield and lowers the sale value of the affected cows. Above all, the breaks in the ranks of valuable pure-bred cows and the cost of replacing them in a farm, are most keenly felt by breeders of pure-bred cattle. In addition, the disease incapacitates the work bullocks considerably and decreases their efficiency very much as they get bursitis of the joints at the knees and hocks.

The importance of the disease to the community at large has come to be more clearly recognised when it is realised that the disease is communicable to human beings also. As the major sources of infection to human beings are by consuming raw dairy products or by contact with the infective discharges from affected animals, the prevention and control of Brucellosis in man is directly dependant on its control and eradication in domestic animals. Hence a major effort needs to be directed to

bring the disease under control in animals which act as reservoirs of infection and as a means of transmission to man.

In the Madras State the disease is found to be widely prevalent in some of the districts like Coimbatore, Salem, Madurai, Ramanathapuram and Tirunelveli where the infection rate varies from 5 to 20 per cent. The incidence is found to be higher in some of the cattle breeding areas of Coimbatore District. The Veterinary Disease Investigation Officer, Madras, has carried out some extensive surveys during the last two decades and collected valuable information about the incidence of the disease in the different districts of the State. He has also confirmed the existence of the disease in several villages by carrying out suitable diagnostic and laboratory tests and has also carried out vaccinations in some of the villages with successful results.

During 1952, experiments were commenced at the Institute to produce *Brucella Abortus* Vaccine and the diagnostic agents (Antigens) for the quick test and the tube test. The strains of *Brucella abortus* organisms for this purpose were obtained from the Indian Veterinary Research Institute, Mukteswar and the method adopted was the one used by the Bureau of Animal Industry, Washington D.C. Both the vaccine and antigens produced were found to be potent and efficient and compared well with the products prepared and supplied from the Indian Veterinary Research Institute, Mukteswar. These products were supplied to the Veterinary Disease Investigation Officer (Cattle), for controlling outbreaks of the disease and for carrying out calfhood vaccinations.

In the year 1954, the Madras Government sanctioned a scheme for the survey and control of Brucellosis in the Coimbatore District with necessary staff to be worked under the control of the Veterinary Disease Investigation Officer (Cattle), Ranipet. During the past 3 years, 206 villages in Coimbatore were visited, necessary survey and diagnostic tests carried out and 17,063 vaccinations, mostly of calves in the area were performed with the *Brucella Abortus* Vaccine prepared and supplied from the Institute.



The results of the vaccinations carried out is reported to be encouraging.

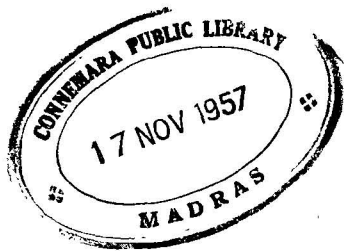
Convinced of the success achieved in the preliminary work carried out and realising the importance of this disease with regards to the various schemes for the development of livestock in the State, the Government have sanctioned quite recently a comprehensive scheme for the survey and control of Brucellosis in the State, particularly in the four districts of Coimbatore, Salem, Madurai and Tirunelveli with a half grant from the Indian Council of Agricultural Research, New Delhi. A Research Officer with necessary staff and a laboratory has been sanctioned for the purpose and the Research Officer and the Laboratory are to be located at the Institute of Veterinary Preventive Medicine, Ranipet. The Laboratory will manufacture necessary Brucella Abortus Vaccine and Antigens required for the scheme and also carry out necessary diagnostic tests and isolation procedures with suspected materials received from the field staff. An Officer with some of the staff have been appointed recently and the survey work is expected to be taken up very shortly.

In the first instance, it is proposed to carry out a systematic survey of the incidence of the disease

in the different villages, determine the correct level of incidence, map out the endemic areas and then adopt suitable control measures, like (1) isolation and disposal of infected animals, (2) vaccination of all heifer calves aged 8 months to 2 years to increase their resistance to the disease and (3) adoption of suitable disinfection procedures.

A proper and correct working of this scheme is expected to give a clear idea of the incidence of the disease in the four important cattle breeding districts of the State and throw light on the success of the measures proposed for the control and eradication of the disease from the State. It requires a proper understanding of the problem and the whole-hearted co-operation of the cattle owners in these districts. Ambitious plans for the development of livestock in the State have been proposed and are in operation in these districts and unless this disease is properly diagnosed and effectively controlled, it may be very difficult to achieve the desired target and obtain quick results.

Though statistical data is not available to assess the correct incidence of this disease in human beings, an effective control of this disease in animals will certainly bring down the prevalence of this disease in human beings.



# Sheep Pox and its control

T. SUBRAMANIAN

Sheep Pox is a highly contagious and infectious disease affecting sheep. It is similar to small-pox in human beings and causes heavy economic loss to the sheep owners due to deaths among the affected and damage to the fleece and skin of the majority of those that survive the attack.

This disease is widely prevalent in India and occurs in an epidemic form. It affects sheep of all age groups, but in young sheep it is more severe. Outbreaks of the disease occur usually during the dry weather following rains. The disease is caused by a virus and spreads by contact as well as through the infective agent borne by air.

The incubation period of the disease is 5—10 days and the mortality varies from 10—50%.

The disease is manifested in the early stages with a rise of temperature and consequent systemic disturbances. By about the 5th day red papules appear and become vesicles containing clear fluid on or about the 7th day. These later form into pustules and by about the 10th or 15th day scabs are formed and these dry up later. The course of the disease extends to a period of 3 to 4 weeks. In some cases the lesions are nodular in type and appear as raised hard nodules

1/2 to 1" in diameter in the different parts of the body. The lesions are well noticed on the face, around the nostrils, ear, under surface of tail; around the anus, scrotum, etc. In some instances, lesions become haemorrhagic or confluent.

There is no known treatment for this disease. The only way to control the disease is by the adoption of suitable preventive measures. Isolation of the affected ones, proper disposal of infective material, disinfection of the premises and adoption of suitable sanitary measures go a long way in checking the spread of the disease. Sheep recovered from the disease are immune for their life time.

Healthy sheep in affected areas can be afforded temporary protection against the disease by the administration of hyper-immune serum. Different methods for protecting sheep against this disease and to afford long and lasting immunity to them were being tried and one of the earliest methods adopted was "Ovination" which consists in artificially infecting healthy sheep in an affected area either in the tail or near the tip of the ear with the vesicular fluid collected from a sheep suffering from the disease. Generally this produced the disease in the vaccinated animals in a mild form and though good results have been claimed by the use of this method, on certain occasions it has been the cause for spreading the disease resulting in heavy mortality.

During 1947, experiments were commenced at this Institute to prepare a vaccine for the control of this disease. Sheep were infected in the abdomen with the local strain of Sheep Pox Virus, and when the scabs dried up, they were collected with aseptic precautions dried in a desiccator and stored in a refrigerator. A 1% emulsion of these dried scabs in 50 per cent glycerine saline was prepared and this was used as a vaccine for vaccinating sheep by the scarification method on the inside of the ear. Good results were obtained with the vaccine and a number of outbreaks were controlled successfully.

Repeated attempts to attenuate the virus by adopting it to other species of animals and the

chorio-allantoic membrane of developing hen's eggs have not proved successful so far.

During 1952, at the suggestion of the Food and Agricultural Organisation Experts, the virus was injected subcutaneously in the abdominal region in young susceptible sheep, and the gelatinous infiltrations and lesions formed were harvested for use in vaccine production. The material collected was emulsified and freeze dried in ampoules and store in a deep freeze cabinet at  $-20^{\circ}\text{C}$ . The freeze dried material is capable of producing lesions in healthy sheep in as high a dilution as 1 in 1,00,000 and is used as a vaccine for vaccinating sheep by the scarification method, after mixing it with 50% glycerine saline in a dilution of 1 in 500. This vaccine is now used in the field for controlling outbreaks of the disease with considerable success, though it has also been reported to have produced generalised lesion in a few of the vaccinated sheep in certain places.

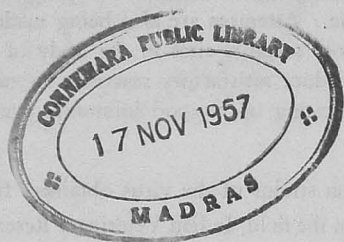
Experiments to attenuate the Sheep-Pox Virus by treating it with chemicals like phenol, forma-

lin, etc., or adopting it to chorio-allantoic membrane of developing hen's eggs are in progress at this Institute. Attempts are also being made to find out more suitable sites in the body of the sheep to produce satisfactory reactions to vaccination for setting up a good immunity against the disease.

Studies on strains of the virus obtained from outbreaks in the field, Indian Veterinary Research Institute, Mukteswar and Serum Institute, Mysore, show that all the strains studied are immunologically identical with the strain used in the Institute for vaccine production.

During the past 8 years, 4,44,680 doses of the vaccine have been prepared and supplied from the Institute for controlling outbreaks of the disease in the districts.

An I.C.A.R. Scheme to improve the present Sheep Pox Vaccine is in operation at the Institute.



# Ranikhet Disease and its Control

SRIMATHI ANNAMMA JACOB.

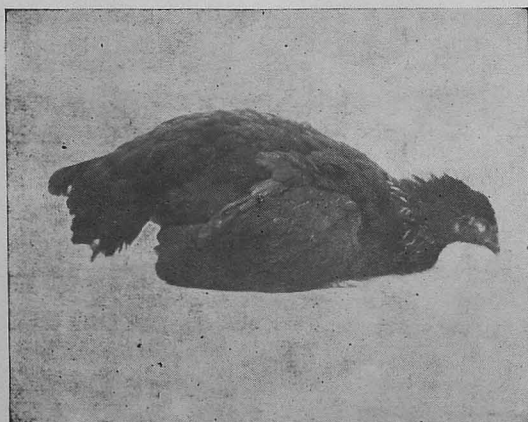
Ranikhet or New Castle Disease is enemy No. 1 to poultry breeders and has been responsible for heavy mortality among poultry in various parts of the World. It is an acute and highly contagious disease of domestic fowls and turkeys, and is caused by a filterable virus. The mortality rate is very high ranging from 90 to 95% and many of the poultry breeders are scared away by this disease as their entire flocks are wiped away suddenly. Treatment of the affected birds is of

no use. The only satisfactory method of controlling the disease is by preventive vaccination and by adopting suitable hygienic measures. The virus is reported to be infective to human beings also, as it produces a sort of conjunctivitis when it comes in contact with the eyes.

The disease affects all breeds of domestic fowls irrespective of their age and the birds that recover are found to acquire a high degree of immunity against the disease.

The important symptoms noticed are, sudden sickness, dullness, refusal of feed, diarrhoea, drooping of the wings accompanied by long gasping respiration through the half opened beak. Some birds develop paralysis of legs, twitching of the neck and torticollis. The egg production completely stops in affected birds.

The disease can be prevented and controlled by adopting suitable sanitary measures and vaccination of all healthy birds with a potent Ranikhet Disease Vaccine. As a result of research studies carried out in England and at the Indian Veterinary Research Institute by Iyer, Dobson, Haddow and Idnani, a potent and safe egg adapted vaccine is now available for the control of this disease. Extensive laboratory and field trials have established the usefulness and high immunising value of this vaccine and by the careful and judicial use of this vaccine millions of valuable poultry have been saved in the country during the last decade.



Fowl suffering from Ranikhet Disease.

During 1946, a Ranikhet Disease Vaccine Section was established at the Madras Veterinary College to manufacture and supply sufficient Ranikhet Disease Vaccine for protecting the valuable poultry in this State from this dreadful disease. The vaccine produced was highly potent and useful, and became very popular among poultry owners. It gave them new hope and confidence on re-establishing this lost poultry industry. The vaccine produced a good and lasting immunity, but due to its fragile nature and the liquid form in which it was prepared and supplied, it had to be handled carefully and stored or transported in ice as far as possible. This is one of the most popular vaccines used by the Animal Husbandry Depart-



Inoculation of eggs for vaccine production.

ment for controlling disease of livestock in the State and the demand for it is increasing day by day.

During February 1954, this vaccine production centre was transferred to the Institute of Veterinary Preventive Medicine, Ranipet, from the Madras Veterinary College. At this Institute, the vaccine is prepared in a freeze dried form with the help of a freeze drying equipment and other appliances provided by the Food and Agriculture Organisation of the United Nations. At the Institute, in addition to the amniotic and allantoic fluids from infected eggs which were used as vaccine hitherto, the embryos and membranes harvested from these eggs are also used in the preparation of the vaccine, giving a higher yield of material from each infected egg and making the vaccine production more economical.

The vaccine, now prepared and supplied in the freeze dried form from this Institute in vacuum sealed glass ampoules, has several advantages over the vaccine supplied in the liquid form hitherto. viz., (1) The quantity of the vaccine obtained from each infected egg is much more. (2) The bulk in the vaccine is considerably reduced making it easy for transport. (3) The viability and keeping quality of the vaccine is much improved and the vaccine can be easily supplied by post instead of through a messenger

in ice in thermos jars. The vaccine can be stored in a deep freeze cabinet at  $-20^{\circ}\text{C}$ . for over two years and in a household refrigerator for about two months without loss of potency. (4) The vaccine can be used safely for protecting chicks above six weeks of age. (5) The immunity conferred by the vaccine lasts for the life time of the bird. (6) It is now possible to store sufficient stocks of the vaccine to meet any emergency.

Since this vaccine has achieved the two most important qualities for a vaccine, viz., cheapness and safety, it is the vaccine of choice for protecting the valuable poultry in the State against this deadly disease. The observance of strict sanitary measures and timely protection of all poultry at the age of six weeks and above, will go a long way to reduce the mortality among fowls due to this devastating disease.

This vaccine is getting more and more popular among poultry breeders and the demand for it is increasing every day. With the availability of this potent vaccine, poultry owners in the State can now confidently take up to the expansion of the Poultry Industry and contribute substantially to the Nation's prosperity, food, health and happiness.



Harvesting of infected embryos.



A total of 31,386 ampoules of Ranikhet Disease Vaccine or 62,77,200 doses were manufactured and supplied to the field during the past three years.



Vaccination of fowls against the disease,



# Fowl-Pox and its Control

K. RAMANI.

Of all the contagious and infectious diseases affecting poultry in the State, Fowl-Pox ranks second only to Raniket Disease. This disease is caused by a virus and affects commonly fowls of all ages though birds like turkeys and guinea fowls also occasionally get the disease. Young chicks are more susceptible to the disease and the mortality among them is comparatively high. The important symptom of the disease is the appearance of nodular eruptions on the comb, wattles, eyelids, face, beaks and other unfeathered parts of the body. The disease usually occurs during the winter and early summer months and spreads rapidly by close contact and through the bites of mosquitos.

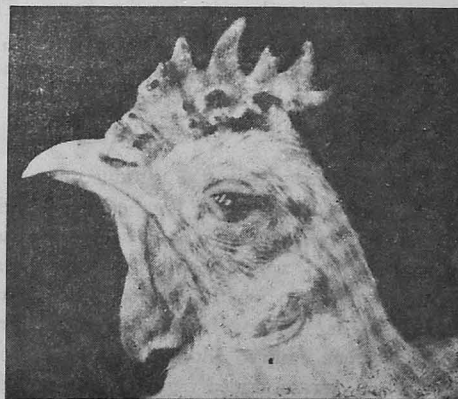
Considerable economic loss is caused to the poultry breeders by the prevalence of this disease, as it produces heavy mortality among young chicks and interferes with the normal growth and development of those that survive for a considerable time. The disease also affects the egg yield of laying hens. Hence it becomes necessary that outbreaks of this disease are controlled promptly and its spread and recurrence arrested.

In Madras State, till the year 1940 a Pigeon-Pox Scab Vaccine manufactured at the Indian Veterinary Research Institute was obtained and

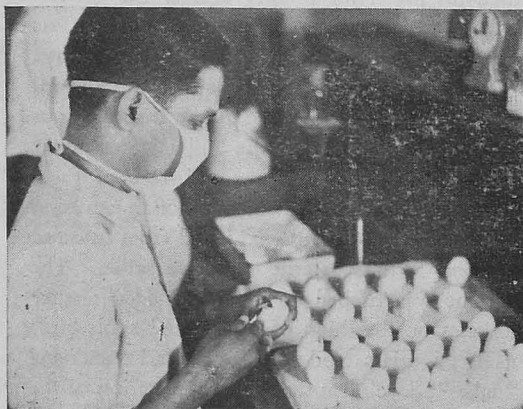
used for protecting poultry against the disease. During that year the preparation of Pigeon-Pox Vaccine was taken up at the Serum Institute, Madras, and from then onwards the Pigeon-Pox Scab Vaccine prepared at the Institute was supplied to the staff of the Animal Husbandry Department for controlling outbreaks of Fowl Pox. The vaccine then consisted of an emulsion of the desiccated scabs (harvested from infected pigeons) in 50% sterile glycerine saline. The vaccine was rubbed on a few denuded feather follicles on the thigh of chicks and adult birds using a glass rod or brush. Characteristic "takes" develop at the site of application of the vaccine on the 5th or 6th day in the form of enlargement of the feather follicles showing that the birds have been satisfactorily immunised.

During the subsequent years, the powdered dry scab and the diluent were supplied in separate containers to be mixed just prior to use so that the virus may be fresh and viable at the time of vaccination.

As a result of a series of experiments carried out at this Institute, the Pigeon-Pox Scab Virus was successfully adapted to the C.A. membrane of developing hen's eggs and grown in the membrane during the year 1953. The infected membranes which were rich in viral content and also free from bacterial contamination were freeze dried in a Edward's centrifugal freeze drier available at the Institute. Since 1953 this freeze dried Pigeon-Pox Vaccine is used for



Fowl suffering from Fowl-Pox.



**Infecting eggs with Fowl-Pox Virus for vaccination production.**

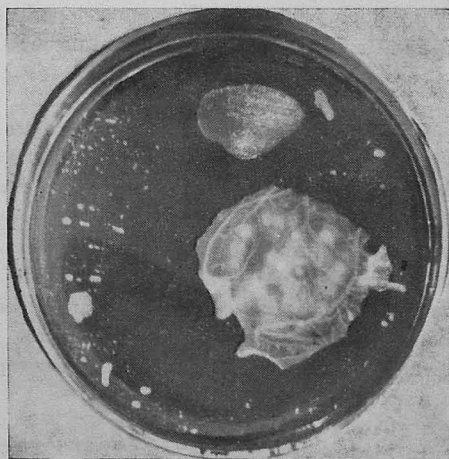
protecting poultry and chicks against Fowl-Pox in the place of the scab vaccine used till then. The advantages of using the freeze dried chick embryo adopted product are, that the vaccine is free from bacterial contamination, remains viable for long time and could be stored in a deep freeze cabinet at  $-20^{\circ}\text{C}$  for nearly 2 years. Further, it could be transported over long distances by post without much loss of potency. In addition, the vaccine is safe for use on very young chicks as it causes very little systemic disturbance in them and at the same time confers protection for a period of about two to three months. By systematic and periodical vaccination of the new crops of young chicks with this Pigeon-Pox Vaccine, it has been possible to prevent the infection getting a foot-hold in many of the poultry farms and units in the State. This vaccine, due to the mild reaction induced, is specially useful for protecting chicks below 6 weeks of age and for protecting poultry of all ages in actual outbreaks of the disease.

Simultaneously with the production of the chick embryo adopted Pigeon-Pox Vaccine, experiments were undertaken to evolve a suitable vaccine which would confer a stronger and lasting immunity without producing severe reactions or serious complications. During 1951, a chick embryo adopted strain of Fowl-Pox virus was obtained from Dr. Beaudette of U.S.A. This strain was successfully passed

into the C.A. membrane of developing hen's eggs and is being maintained in the Institute for use in vaccine production. The infected membranes which are rich in Fowl Pox virus are used in the production of the Fowl-Pox Vaccine in a freeze dried form. This Fowl-Pox Vaccine after reconstitution with saline is used for protecting chicks above six weeks of age in free areas by the wing web puncture method of vaccination. The vaccine is found to be slightly virulent for chicks below 6 weeks of age as it is liable to cause secondary lesions in them with some mortality also. However, as this vaccine confers a stronger and lasting immunity as compared to the Pigeon Pox Vaccine, it will be advantageous to vaccinate all young chicks with the Pigeon-Pox Vaccine in the first instance and vaccinate them again with the Fowl-Pox Vaccine as soon as they reach the age of 6 to 8 weeks.

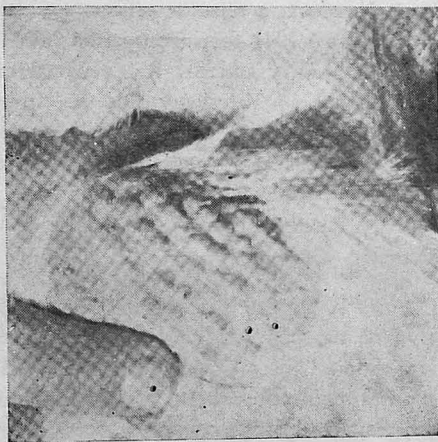
Sufficient stocks of the egg adapted Pigeon Pox and Fowl-Pox Vaccines are always maintained at the Institute and these are supplied to the staff in the Madras and Andhra States to protect the valuable poultry from Fowl-Pox. By their timely use, losses to poultry industry have been considerably reduced in recent years.

The work of the Institute does not stop with the production and supply of these vaccines alone. The staff are constantly engaging themselves in the task of further improving the efficiency of the

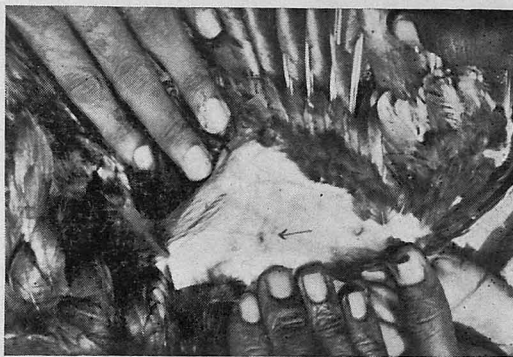


**C. A. Membrane from infected eggs showing lesions.**

present vaccines and to evolve new strains of attenuated Fowl Pox Virus which can be used safely on young chicks, at the same time setting



Reaction after vaccination by the feather follicle method.



Lesions in the wing web after vaccination.

up a stronger and lasting immunity in them, as the satisfactory protection of young chicks against Fowl Pox still presents a great problem. A special scheme for this purpose is in operation at this Institute.





# Veterinary Disease Investigation and Research

## Investigation into the Disease of Cattle

SRI V. VENKATARAMAN, G.M.V.C.

The Veterinary Disease Investigation section was started on 1st April 1933 by a grant given by the Imperial Council of Agricultural Research and was located at the Madras Veterinary College. Sri G. Viswanatha Iyer was appointed as Veterinary Disease Investigation Officer, to investigate the various diseases of livestock in Madras State.

In the first instance, investigation on Black-quarter which was taking a heavy toll of cattle in the State at the time was taken up. As a result of intensive field and laboratory investigation, he was able to establish that this disease is mainly caused by *Cl. Chauvoei*, and in certain cases by *Cl. Septique* and occasionally by *Cl. Welchii* also. He also conducted some investigations on sheep diseases like Enterotoxaemia, Contagious caprine pleuro-pneumonia, etc., and on Flourosis among cattle. Further, he carried out an initial survey on Brucellosis among cattle in the State and marked out the endemic areas of the disease along with Mr. Folding,

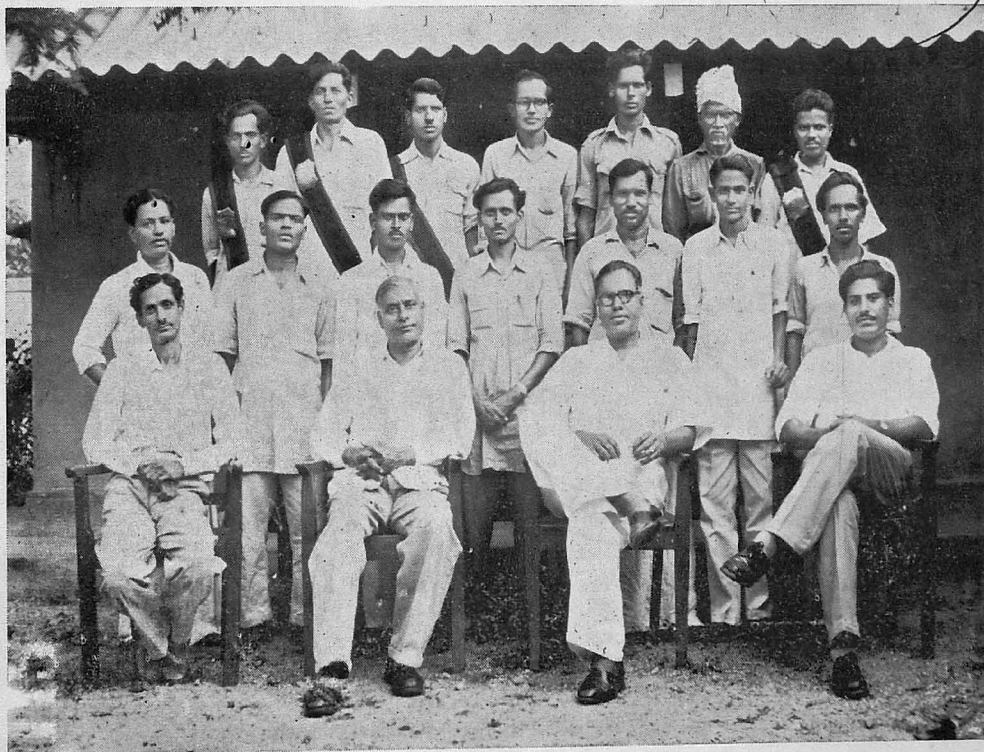
Research Officer of Imperial Veterinary Research Institute, Mukteswar. Due to the heavy work in the section and finding that it was difficult for one officer to tackle single handed all problems affecting livestock, a separate officer was sanctioned in April 1941 for investigation into the diseases of poultry and Sri R. Venkataraman was appointed as Veterinary Disease Investigation Officer (Poultry). Subsequently, an additional officer was also sanctioned in 1946 and Sri T. Ananthapadmanabhan was appointed as Veterinary Disease Investigation Officer (Sheep and Goats).

During 1947, Sri M. Ramakrishnan took charge of the post of the Veterinary Disease Investigation Officer (Cattle) and continued in that post till his retirement in July 1956. During 1948, the Veterinary Investigation sections were transferred from Madras Veterinary College, to the present buildings at Ranipet. Sri Ramakrishnan, during his period surveyed the endemic areas for Anthrax, in the different parts of the State and popularised the use of Anthrax spore vaccine and demonstrated that the vaccine is a safe and potent product and can be used confidently by the field staff for routine systematic vaccination of cattle in the endemic areas of the disease.

As a result of the early work carried out by Viswanatha Iyer, and Polding, and also due to the encouraging results obtained by the experimental vaccinations conducted against Brucellosis by Sri M. Ramakrishnan, in selected areas of the disease, a scheme for the control of Brucellosis among cattle was sanctioned in 1954 with a special staff and the scheme was launched in the Coimbatore district which is the breeding tract for the Kangayam breed of cattle. Intensive work was carried out in some of the taluks in the district, a survey of the incidence of the disease in the villages made, the extent of infection studied, endemic areas mapped out and vaccination of all calves between the ages of 8 months to 2 years were carried out. As a result of the encouraging results obtained in the field, the Indian Council of Agricultural Research was pleased to sanction a more elaborate scheme for the survey and control of Brucellosis.



CONNEMARA PUBLIC LIBRARY  
17 NOV 1957



STAFF OF THE VETY. DISEASE INVESTIGATION SECTION

in the State and covering 3 more districts where the disease is widely prevalent.

In July 1956, Sri V. Venkataraman, took charge of the post from Sri M. Ramakrishnan. During the past one year, in addition to the investigation of cattle diseases, experimental vaccinations in the field against Haemorrhagic Septicaemia using the new oil adjuvant vaccine was carried out in the two districts of Tanjore and Chingleput which are highly endemic for the disease to assess the usefulness of this vaccine in the control of Haemorrhagic Septicaemia and over 7,000 vaccinations have been done so far. During the period, investigations were also carried out on Surra infection among cattle which has assumed alarming proportions in North Arcot district.

In addition to the routine investigations in the field, the Veterinary Disease Investigation Officer (Cattle) periodically visits the different livestock farms in the State to assist the farm staff in the diagnosis and treatment of the various diseases among the farm animals.

---

## Investigation into the Diseases of Poultry

SRI A. R. MADHUSUDAN, G.M.V.C.,  
*Veterinary Disease Investigation Officer (Poultry),  
Madras State, Ranipet.*

The scheme for the investigation into the diseases of poultry in Madras State was started in the year 1941.

Of the diseases investigated Ranikhet Disease was found to be the most important of all poultry diseases causing heavy mortality in fowls at all seasons of the year. The Komorov strain of Ranikhet Disease vaccine now prepared in the Institute of Veterinary Preventive Medicine, Ranipet has been found to be an efficient vaccine

for immunising birds against Ranikhet Disease. Seven thousand, nine hundred and twenty-two birds have been vaccinated by me during the past three years. The post vaccination reaction has been very mild and the mortality after the use of this vaccine was practically negligible.

The vaccine confers an immunity for a period of at least three years and is found to be safe for immunising chicks aged 4 weeks and above.

**Fowl-Pox.**—This disease is next in importance to Ranikhet Disease and is responsible for heavy mortality among young chicks in particular.

In areas free from the disease more than 6,313 chicks of 2 weeks and above have been vaccinated by me with Pigeon Pox Vaccine during the course of three years by feather follicle method with good results.

In places where such systematic vaccination was conducted on chicks of 2 weeks old, the incidence of Fowl-Pox at a later stage has been found to be rare. In the American Arcot Missiou Poultry Farm, Katpadi, systematic mass vaccination is being done every year on chicks of 2 weeks old with Pigeon-Pox Vaccine by feather follicle method and the incidence of Fowl-Pox has been controlled effectively.

Since the duration of protection conferred by this Pigeon-Pox Vaccine is only for about 2 months, it is found necessary to revaccinate the chicks with Fowl-Pox Vaccine when they are 6 weeks and above of age to confer longer period of protection.

In actual outbreaks of Fowl-Pox, 3,663 birds of all ages including baby chicks have been protected with Pigeon-Pox Vaccine during the last 3 years and the post vaccination reaction has been satisfactory and the disease has been controlled.

**The Egg-adopted Beaudette strain of Fowl Pox vaccine.**—As a result of more than five thousand vaccinations carried out with the egg adopted Beaudette strain of Fowl-Pox Vaccine on chicks aged 6 weeks and above, it has been possible to establish that this vaccine is a safe

product for use in free areas on chicks aged 6 weeks and above.

**Contagious Coryza.**—This disease which causes heavy mortality in young chicks, is manifested by a faetid nasal discharge which subsequently becomes thick, cheesy and mucopurulent causing respiration very difficult in affected birds. In some cases their eyes also get affected and the birds lose both their eyes and become blind. This disease sometimes follows an outbreak of Fowl-Pox.

As a control measure, the affected birds are isolated and sanitary measures are adopted. They are treated with Dihydro-Streptomycin sulphate in appropriate doses with very encouraging results.

A vaccine manufactured with the organisms (Coryne-bacterium in type) isolated from affected birds has given encouraging results as a prophylactic measure.

**Avian Leucosis Complex.**—The incidence of this disease was mostly seen in exotic breeds and the age at which birds manifested symptoms of the disease has been from 6 months to one year. The affected birds manifested the neurotropic form of the disease in which the wing or the leg got paralysed or the visceral form of the disease involving any of the internal organs. The liver, kidneys and spleen were often found enlarged or tumours of varying sizes were present. This enlargement is caused by replacement of normal tissue cells with immature white blood cells.

The affected birds manifested poor condition and were light in weight when handled. They, besides manifested general weakness, emaciation and abnormal paleness of combs and wattles resulting from anaemia.

**Control measures adopted.**—Systematic weightment and haematological examination of birds have been done to spot out the affected birds. Out of about 2,000 birds examined during the past three years 184 birds showed in their blood-pictures numerous immature

lymphoid cells suggestive of the disease. Their weight was also far below the average.

The officers in charge of the farms were advised to follow strictly necessary preventive measures to control the disease.

---

## Investigation into Diseases of Sheep and Goats

SRI K. ANANTHARAMANABHAN, G.M.V.C.,  
*Veterinary Disease Investigation Officer (Sheep and Goats), Ranipet.*

In the year 1946 an independent officer was appointed for investigating into the diseases of sheep and goats in the State.

Intense studies were made in the field and in the laboratory on important diseases like Sheep-Pox, Enterotoxaemia, Anthrax, Johne's disease and many other incidental causes. The loss due to Sheep Pox is estimated to be about four million rupees per year, Enterotoxaemia eight million rupees a year and Anthrax two million rupees a year.

Protection of sheep and goats against Anthrax was first taken up with the Anthrax Spore Vaccine obtained from the Indian Veterinary Research Institute, Mukteswar. The use of this vaccine was undertaken by the Veterinary Disease Investigation Officer (Sheep and Goats), Ranipet, both in actual outbreaks of the disease and also in endemic areas and close observations made. The results of such vaccinations proved so effective that it is a proud privilege to state that vaccinations are conducted in thousands in advance of the disease and the deaths stopped completely. The increased demand for this vaccine in our State has initiated its production at the Institute of Veterinary Preventive Medicine, Ranipet to facilitate quick supply and to-day thousands of doses of this vaccine is being issued

to the field staff for protecting sheep and goats against this disease.

The incidence of Sheep-Pox was studied intensively and it is now possible to say that as a result of the many tests conducted in this laboratory and the observations made in natural outbreaks that the identity of the disease does not seem to have always a uniform character with the same type of lesions in the affected animals. In the past years there was much confusion and controversy about the correct etiology of the disease in different places due to the differences in the clinical manifestation. The incidence of this disease has been found in every place in the State where sheep are maintained. The control of this disease is at present a matter of great study and it is being done with a vaccine manufactured at the Institute of Veterinary Preventive Medicine, Ranipet. The Veterinary Diseases Investigation Officer (Sheep and Goats) is undertaking this work and conducting vaccinations by different methods and studying the results. The studies are intensively carried out both in the field and in the laboratory and from the results so far seen, a satisfactory method has been evolved for protecting sheep against this disease with this vaccine by the intradermal injections in the outer aspect of the ear towards the tip.

Enterotoxaemia among sheep has been causing tremendous loss in the past years. Several thousands of sheep have died. Constant attempts were made in different directions to understand the etiology of the disease. After facing helpless situations till 1952 in villages where sudden deaths were occurring among sheep due to symptoms of toxæmia, it was established in that year that Enterotoxaemia

was the cause of such mortality and Madras State took the first credit in India to correctly understand the same. Techniques and tests on the lines suggested by the pioneer workers were rapidly introduced and in several outbreaks it was possible to establish the disease as Enterotoxaemia. Wide publicity was given to the people on the preventive measures to be adopted and to carefully follow certain important principles while grazing their sheep. A Clostridium Welchii Anaculture is now prepared at the Institute of Veterinary Preventive Medicine, Ranipet and thousands of sheep have been protected in the State against the disease with absolute safety in the past few years. By the investigations conducted in the field it is now possible to mark out areas where its incidence was more and also the seasons when the same occurs and vaccinations are now conducted in such areas in advance of the outbreaks and deaths are controlled.

Barring these three major diseases investigations are conducted on many other diseases like John's disease, Tuberculosis, Brucellosis and diseases due to helminthic and protozoid infections.

In conclusion it may be said that in Madras State the economics of sheep and goats is very great and the diagnosis, control and prevention of diseases among them is a very vital issue. Every attempt is being made by the Veterinary Disease Investigation Officer (Sheep and Goats), Ranipet with the co-ordinate assistance of the entire staff of the Animal Husbandry Department, Madras, to achieve this end, viz., to prevent loss due to diseases and save the sheep and goat population in the State.

